

# NAVAL POSTGRADUATE SCHOOL

## Monterey, California



## THESIS

PERFORMANCE BASED SERVICES ACQUISITION:  
AN ANALYSIS OF PERFORMANCE BASED LOGISTICS  
SERVICES

by

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December 2001

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PERFORMANCE BASED SERVICES ACQUISITION: AN ANALYSIS OF  
PERFORMANCE BASED LOGISTICS SERVICES

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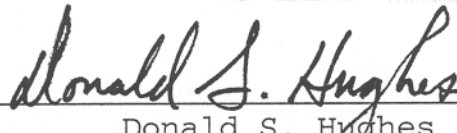
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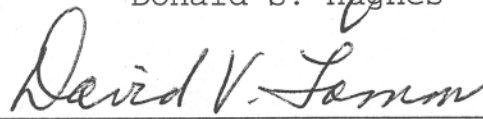
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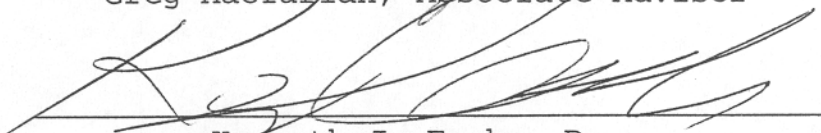
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## **ABSTRACT**

Performance Based Services Acquisitions (PBSA) has recently garnered a significant amount of attention in the realm of Federal procurement. The procurement of services accounts for nearly half of the Federal dollars spent annually and a portion of that is spent for logistics services. Obviously, this is a dynamic time for acquisition reform and as acquisition professionals; each of us needs to manage PBSA contracts in a manner that applies sound business judgment. This can be accomplished by employing strategies that rely on our education, training and lessons learned from the shared past experiences of the acquisition community. The purpose of this thesis was to determine the essential features of a classification system for logistics services. For selected logistics services from the OMB Circular A-76 the researcher applied an existing model (Allen, 1991) in order to evaluate logistics services. The methodology employed to gather data was a survey distributed to a select group of acquisition professionals. The survey data were analyzed to identify key issues associated with evaluating a classification system for logistics services. The thesis concludes with recommendations for implementing a classification scheme for logistics services within the Federal Government.



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## **I. INTRODUCTION**

It is the policy of the Department of Defense that, in order to maximize performance, innovation and competition, often at a savings, performance based strategies for the acquisition of services are to be used wherever possible. While not all acquisitions for services can be conducted in a performance-based manner, the vast majority can. Those cases in which performance-based strategies are not employed should become the exception. In order to ensure that the Department continually realizes these savings and performance gains, the Department of Defense establishes, at a minimum, that 50 percent of service acquisitions, measured in both dollars and actions, are to be performance-based by year 2005. Dr. Gansler, Under Secretary of Defense, Acquisition, Technology & Logistics, April 5, 2000 [Ref. 1]

### **A. BACKGROUND**

In January of 2000, Dr. Gansler, at that time the Under Secretary of Defense for Acquisition, Technology and Logistics signed the Guidebook for Performance Based Services Acquisition (PBSA) in the Department of Defense [Ref. 2]. This guidebook was necessitated by the fact that from 1992 to 1999, Department of Defense procurement of services increased significantly and in 1999 the total dollars spent on services equaled the amount spent on supplies and systems. Obviously, this is a dynamic time for acquisition reform and as acquisition professionals; we need to manage processes by applying sound business judgment. This can be accomplished by employing PBSA strategies that rely on our education, training and lessons learned from the shared past experiences of the acquisition community.

Therefore, PBSA strategies must emphasize what the Government's objectives are, i.e. what it wants performed by a contractor vice how the work should be performed. This can be accomplished by developing a performance work statement that defines the required work in objective, measurable terms. Performance standards such as timeliness, quality and quantity should then be assigned to the required tasks. This begs the question, how do we measure performance? What are the relevant metrics and how can we classify them? To start there has to be a relevant classification system for services. There are currently Government classification schemes such as the Federal Supply Classification (FSC) the Standard Industrial Classification (SIC) and the North American Industrial Classification system. However, these systems are very broad and do not provide sufficient information regarding the classification of services, in particular logistics services.

By establishing a classification for logistics services and incorporating the principles of PBSA management into the procurement process, the acquisition workforce can more easily identify adverse performance trends, incorporate metrics that are predictive in nature and allow for overall better management of PBSA contracts.

## **B. RESEARCH OBJECTIVE**

The purpose of this thesis is to evaluate the issues associated with Performance Based Services Acquisition (PBSA) and to attempt to classify the services within the Federal Government, specifically those associated with logistics services. The researcher utilized a matrix developed by a former Naval Postgraduate School thesis

student [Ref. 3] for the purpose of identifying logistics services and how they can be constructed into PBSA.

As discussed in the introduction, PBSA is important as evidenced by the fact that over half of the Department of Defense procurement dollars are expended for services. The Balkans support contract and the Army's Logistics Civil Augmentation Program (LOGCAP) are two cases where the Department of Defense has invested a great deal with the probability that there will be significant savings. However, these contracts have proven to be difficult to evaluate from a performance standpoint, as they are extremely subjective in nature. A classification scheme for logistics services is intended to assist in properly grouping together like services to assist in identifying potential candidates for PBSA. Additionally, by comparing the salient characteristics and grouping like services in a strategic manner it will help to enable trend analysis, correct deficiencies, improve performance and ultimately enable the Department of Defense to realize a return on investment for PBSA contracts.

### **C. RESEARCH QUESTIONS**

The primary research question is:

- What would be the essential features of a taxonomical structure that would classify logistics services as procured by the Federal Government?

The following are subsidiary research questions:

- What is the background and history of Performance Based Services Acquisition?
- What is an appropriate classification scheme for logistics services as related to Performance Based Services Acquisition?

- What are the challenges facing Performance Based Services Acquisition and what does the future hold?

#### **D. SCOPE, LIMITATIONS AND ASSUMPTIONS**

The scope of this thesis will include six areas. (1) An introduction to the thesis that identifies the primary and subsidiary research questions. It will also discuss the scope, methodology and organization of the thesis; (2) A review of the history and regulations regarding the evolution of Performance Based Services Acquisition in Government procurement. In addition, an introduction and review of the background, definitions, and logistics services is provided; and an examination of current Performance Based Services Acquisition procedures in the Department of Defense is provided. The researcher has also provided a short discussion regarding performance metrics as they relate to PBSA. This chapter will conclude with a presentation of issues and concerns associated with Performance Based Services Acquisition for the present and future; (3) An introduction to classification systems and the types as well as the evolution of the model used for the researcher's efforts. (4) A presentation of data, the objective of a survey and appropriate demographics. (5) An analysis of the data will be presented. (6) Conclusions, recommendations and findings will be discussed as well as a review of potential benefits associated with using Performance Based Services Acquisition.

The main limitation associated with this thesis is that the researcher has limited the area of research to one area of Performance Based Services Acquisition, logistics services. The magnitude of developing a classification

scheme for PBSA in general was outside of the scope of this research effort. Therefore, the author utilized the model developed by Allen but changed the services initially used. The intent of this thesis is to examine the current understanding and use of Performance Based Services Acquisition within the Department of Defense. From this understanding a classification scheme for logistics services will be developed.

The thesis will not examine the impact of PBSA and strategic visions related to acquisition reform nor will it apply the classification scheme for any area of acquisition other than the intended area of research.

The major assumption is that the data collected from all Government services can be classified.

- The list of characteristics used to classify services can be modified
- Characteristics of Government procured services exist that lend themselves to ordinal scaling.

#### **E. METHODOLOGY AND LITERATURE REVIEW**

The methodology used in this thesis research consisted of the following steps:

- Conducted a comprehensive literature search of books, magazine articles, CD-ROM systems, Government reports; Internet based materials and other library information resources.
- Reviewed the Guidebook for Performance Based Services Acquisition in the Department of Defense.
- Conducted interviews in person, email and by telephone, with acquisition professionals and senior contracting officials at Department of Defense commands.

- Conducted interviews either in person, email or by telephone, with logistics services providers such as Brown and Root Services.
- Conducted a survey in which acquisition professionals and students in the Contracting and Acquisition curriculum at the Naval Postgraduate School took part.
- In the interest of efficiency and effectiveness, the researcher often uses the research process and structure employed by Allen in his classification of services effort, applying it to logistics services and PBSA.
- Prepared a summary and finding of fact of the advantages and disadvantages that impact the effective and efficient management of Performance Based Services Acquisition.

A literature review was conducted using current policies, reports and articles on Performance Based Services Acquisition as well as classification schemes. From these reviews, a basic understanding of the current policies and concerns related to PBSA and classification schemes was developed.

#### **F. RESEARCH METHODOLOGY**

The basis for this research was a variation of the research conducted by Scott Allen, a Naval Postgraduate School graduate. His thesis, entitled "A Taxonomical Structure For Classifying The Services Procured By The Federal Government" focused on developing a taxonomical scheme that could be used by the Federal Government for the procurement of services [Ref. 3]. This will be discussed in greater detail in Chapter IV.

For the purpose of evaluation, the model developed by Allen was a near perfect fit for this research. As such, a data collection package (Appendix A) was fundamentally the

same as that used by Allen. The significant change was the incorporation of different and more service elements; specifically those associated with logistics services. This also will be discussed in Chapter IV.

The researcher surveyed fellow graduate students at the Naval Postgraduate School who were enrolled in both the 815 and 835 curricula in Contracting. Those surveyed included, DoD civilian contracting professionals, U.S. Navy Supply Corps Officers, U.S. Marine Corps Logistics Officers and U.S. Army Officers. In addition, there were a selected few acquisition professionals outside of the Naval Postgraduate School who were asked to participate. Despite the fact that the majority of the respondents were students, many had extensive backgrounds in contracting and the procurement of services.

The researcher distributed sixty data collection packages (Appendix A) to the target group. The package consisted of a cover letter explaining the process, definition and scales of each of the selected characteristics and a matrix. The matrix contained thirty logistics services that corresponded to 12 different characteristics. The researcher chose to use the same characteristics, as did Allen as they represented an appropriate mix as related to the Federal Government. The respondents were asked to read the definition of the first and subsequent definitions and grade each service using the scale that followed the characteristic's definition. This process would require repeating these steps for each of the twelve characteristics and thirty services. In the next step the respondents were asked to select, in their



opinion, the top three characteristics in order of strategic importance. Finally, the respondents were given an opportunity to provide comments related to the survey.

The researcher hand delivered and provided verbal instructions to each of the individuals invited to participate. Based on statistical averages, the researcher was expecting that at best, only thirty percent of the matrices would be completed and returned. Fortunately, as a direct result of the personal interaction between the researcher and the respondents the actual percentage was forty-five. In addition, six more completed surveys were received after the cutoff submission date had passed. Unfortunately, due to the considerable amount of time to calculate the data, the researcher was forced to exclude these data.

#### **G. ORGANIZATION OF THE STUDY**

The thesis consists of six chapters. Chapter I is an introduction to the thesis and provides a detailed structure to the topic as well as the research methodology.

Chapter II provides a review of the background information concerning Performance Based Services Acquisition (PBSA). An introduction to PBSA focuses on current objectives and provides definitions related to PBSA. In addition, the regulatory history, laws and current policies are addressed. Logistics services and performance metrics are also discussed.

Chapter III deals with classification systems in general, the types of classification and existing Government Classification systems.

Chapter IV includes the presentation of the data. It begins with a discussion of the Allen model and how the researcher incorporated it for the purpose of his research.

Chapter V is an analysis of the data collected and how it relates to PBSA.

Chapter VI summarizes conclusions and recommendations that are directly related to the research effort. In addition, it also suggests additional areas for further research in trying to advance how the Department of Defense classifies logistics services and the relationship with PBSA contracts.

The next chapter is an introduction to performance based services acquisition.

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## **II. PERFORMANCE BASED SERVICES ACQUISITION**

As services become an increasingly significant component of what the Department buys, we must ensure that we acquire them effectively and efficiently. That is why the use of performance-based acquisition strategies for services remains among my highest priorities... it is the policy of the Department of Defense that, in order to maximize performance, innovation, and competition, often at lower cost, performance-based strategies for the acquisition of services are to be used wherever possible [Ref. 1].

### **A. INTRODUCTION TO PERFORMANCE BASED SERVICES ACQUISITION**

Performance based services acquisition (PBSA) is here and it seems that it is here to stay. President Bush has endorsed the use of performance-based contracting throughout the Federal Government. PBSA is part of the President's vision for better Government and has been identified as one of the Procurement Executives Council's objectives in the 2001-2005 strategic plan [Ref. 4]. The goal is to increase the use of PBSC to acquire best value services with the objective of attaining a minimum of 50 percent of eligible service dollars awarded as PBSCs by FY 2005 [Ref. 1].

With this much attention, it is imperative that the objectives for PBSA be understood. There are five basic objectives according to the Guidebook for Performance-Based Services Acquisition [Ref. 5]:

#### **1. Maximize Performance**

Allows a contractor to deliver the required service by following its own best practices. Since the prime focus is on the end result, contractors can adjust their processes, as appropriate, through the life of the contract without

the burden of contract modifications provided that the delivered service (outcome) remains in accordance with the contract. The use of incentives further motivates contractors to furnish the best performance of which they are capable.

## **2. Maximize Competition and Innovation**

Encouraging innovation from the supplier base by using performance requirements maximizes opportunities for competitive alternatives in lieu of government-directed solutions. Since PBSA allows for greater innovation, it has the potential to attract a broader industry base.

## **3. Encourage and Promote the Use of Commercial Services**

The vast majority of service requirements are commercial in nature. Use of FAR Part 12 (Acquisition of Commercial Items) procedures provides great benefits by minimizing the reporting burden and reducing the use of government-unique contract clauses and similar requirements, which can help attract a broader industry base.

## **4. Shift in Risk**

Much of the risk is shifted from the Government to industry, since contractors become responsible for achieving the objectives in the work statement through the use of their own best practices and processes. Agencies should consider this reality in determining the appropriate acquisition incentives.

## **5. Achieve Savings**

Experience in both Government and Industry has demonstrated that use of performance requirements results in cost savings [Ref. 5].

## B. DEFINITIONS

The following definitions are key to understanding this thesis topic.

**Performance Based Services Acquisition** involves acquisition strategies, methods, and techniques that describe and communicate measurable outcomes rather than direct performance processes. It is structured around defining a service requirement in terms of performance objectives and providing contractors the latitude to determine how to meet those objectives. Simply put, it is a method for acquiring *what is required* and placing the responsibility for *how it is accomplished* on the contractor [Ref. 5].

**Performance Based Contracting** means structuring all aspects of an acquisition around the purpose of the work to be performed as opposed to either the manner by which the work is to be performed or broad and imprecise statements of work [Ref. 6].

**Services** are identifiable tasks to be performed, rather than the delivery of an end item of supply. Only services obtained under non-personal service contracts are covered [Ref. 7].

**Logistics** is that part of the supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements [Ref. 8].

### **C. REGULATORY HISTORY**

Performance Based Services Acquisition (PBSA) is a major initiative of the Federal Government. The initiative is intended to enhance practical acquisition reform throughout the Federal Government. While this initiative may be new, the idea of performance based contracting is not and in fact, has been around for close to one hundred years. In February of 1908, the Signal Corps, on behalf of the Board of Ordnance and Fortification sent out a request for proposal to contractors to build a Heavier-Than-Air-Flying machine [Ref. 9]. While this is not a traditional service it is an acquisition and it represented the birth of Aviation. The Performance-Based Contract was awarded to Wilbur and Orville Wright and the rest is history. While probably not the first example, it was one of the most interesting. There are numerous examples of how PBSA has influenced Federal Government acquisition policies. There have also been numerous regulations and acts enacted that have paved the way for the current emphasis on PBSA.

The Federal Government's ability to acquire supplies and services is dependent upon existing statutes, acts and regulations. The focus of this portion of research is to concentrate on performance-based services acquisition and how the numerous statutes, acts and regulations impact the Government's ability to acquire services through PBSA.

A brief history of some of the key acts and regulations that have influenced PBSA over the years will help illustrate not only how far PBSA has come but also more importantly its impact on the entire procurement

process. The U.S. Constitution is one of the cornerstones of America, however; initially it did not address the Government's right to enter into a contract. In 1831 the U.S. Supreme Court, "in a landmark decision, *United States v. Tingey*, declared that the Federal Government has inherent power, based on its sovereignty, to enter into contracts. Additionally, the court decision declared that the Federal Government has implied powers, as necessary, for the proper performance of its duties [Ref. 10].

Many of the acts and regulations that followed addressed procurement and while PBSA was not specifically addressed, it was in essence a part of each. Chronologically, the Armed Services Procurement Act of 1947 was one of the first and the Armed Services Procurement Regulations followed it. The Federal Procurement Regulation, the Defense Acquisition Regulation, and the Federal Acquisition Regulation were subsequent tools that have helped to shape how the acquisition community conducts business in today's environment.

The Walsh-Healy Act prescribes minimum wage, hours, age, and working conditions for supply contracts. Any contract entered into by any executive department of the Federal Government for the manufacture or furnishing of materials, supplies, articles, and equipment in any amount exceeding \$10,000 is covered by the Walsh-Healy Act [Ref. 11].

The Davis-Bacon Act prescribes minimum wages, benefits, and working conditions of Federal construction contracts in excess of \$2,000 [Ref. 12].



The McNamara-O'Hara Services Act of 1965 is generally referred to as the Service Contract Act (SCA) [Ref 13]. It governs wages, fringe benefits and the pricing of service contracts for other than professional services. As a general rule, any and all maintenance contracts will fall under SCA - everything from landscaping to aircraft maintenance. However, services to be provided by bona fide executive, administrative and professional personnel are not covered by the SCA. There has been some confusion in the acquisition community as to which contracts fall under the SCA [Ref. 14]. For example, secretarial support is considered to be other than a professional service, and therefore, a contract for this type service is subject to the SCA. If the secretarial support was incidental to the performance of the contract, it would not make the contract subject to the SCA. The key is to determine the predominant intent of entering into the contract.

The Federal Acquisition Regulation (FAR) is one of the major tools for implementing an effective PBSA strategy. FAR 37.6 prescribes policies and procedures for use of performance-based contracting [Ref. 15]. These methods are intended to ensure that required performance quality levels are achieved and that total payment is related to the degree that services performed meet contract standards. Specifically, the FAR delineates the following for Performance-based contracts [Ref. 15].

- a. Describes the requirements in terms of results required rather than the methods of performance of work;
- b. Use measurable performance standards (e.g., terms of quality, timeliness, quantity, etc) and

quality assurance surveillance plans;

c. Specify procedures for reductions of fee for reductions to the price of a fixed-price contract when services are not performed or do not meet contract requirements; and

d. Include performance incentives where appropriate.

In addition, the FAR provides a general listing of activities in which service contracts may be used to acquire services. The following categories are taken from FAR 37.101 and represent like services according to Federal statutes and regulations [Ref. 16]:

(a) Maintenance, overhaul, repair, servicing, rehabilitation, salvage, modernization, or modification of supplies, systems, or equipment.

(b) Routine recurring maintenance of real property.

(c) Housekeeping and base services.

(d) Advisory and assistance services.

(e) Operation of Government-owned equipment facilities, and systems.

(f) Communications services.

(g) Architect-Engineering.

(h) Transportation and related services.

(i) Research and Development.

Obviously, these categories are very general and cover a broad spectrum of the services procured by the Federal Government. But, it should be noted that the U.S. economy is rapidly becoming service oriented as evidenced by the

steady increase in dollars spent by the Federal Government on services.

In 1974, Public Law 93-400, the Office of Federal Procurement Policy Act, created the Office of Federal Procurement Policy (OFPP) [Ref. 17]. Basically, OFPP was created to provide Government-wide procurement policies. There have been many policies set by OFPP and each has had an impact on the Federal Government's \$200 billion annual procurement program. More than half of the \$200 billion are now spent on services [Ref. 18]. PBSA has successfully demonstrated an ability to reduce costs and improve performance. Recognizing the value of Performance Based Contracting, OFPP has made it one of their Priority Management Objectives. In particular, the following three OFPP policy letters have had the most significant impact on service contracting:

- OFPP Policy Letter 91-2 was issued April 9, 1991 and established policy for the Government's acquisition of services by contract. The policy letter emphasized the use of performance requirements and quality standards in defining contract requirements for the acquisition of services [Ref. 6].
- OFPP Policy Letter 92-1 was issued September 23, 1992 and established Executive Branch policy related to service contracting and inherently governmental functions. This policy letter prohibited the use of service contracts for the performance of inherently governmental functions. It also provided separate appendixes that listed services that were considered inherently governmental and not inherently governmental [Ref. 19].
- OFPP Policy Letter 93-1 was re-issued on May 18, 1994 and established Government-wide policy, assigned responsibilities, and provided guiding

principles for Executive Departments and agencies in managing the acquisition and use of services. This policy resulted from the fact that in March of 1993, Leon Panetta, the Director of the Office of Management and Budget (OMB) requested a review of the 17 major Executive Departments and agencies service contracting programs. The purpose was to determine if the service contracts were accomplishing intended goals, whether the contracts were cost effective and whether they were complying with OFPP policy letter 92-1. It was determined that service contracting practices and capabilities were not following best practices and that the various management problems needed to be addressed [Ref. 7]

It could be argued that OMB Circular A-76 is one of the major reasons for the recent surge in services contracting. OMB Circular A-76 set forth guidance and procedures for determining whether commercial activities should be performed under contract with commercial sources or in-house using Government facilities and personnel [Ref. 20]. Basically, it comes down to competitive sourcing strategies and privatization initiatives. It has gotten to the point that inherently Governmental is almost obsolete and there are numerous services currently performed by Federal employees that could be contracted out or privatized. The policy of the Federal Government is to rely on competitive private industry to supply the services it needs [Ref. 20]. OMB Circular A-76 cites a limited list of the types of services and commercial activities that are currently contracted by the Federal Government [Ref. 20]. From this list the researcher identified thirty logistics services in which to study, with the intent of developing a classification specifically for logistics services and how they could be constructed into PBSA.

#### **D. LOGISTICS SERVICES**

Logistics services are not easily defined and most of the available literature is of a commercial nature, specifically, shipping and distribution. However, this research is focusing on how logistics services are viewed within the Federal Government and Department of Defense. Logistics is defined as that part of the supply chain process that plans, implements, and controls efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet the customers' requirements. The FAR defines a service contract in part as "a contract that directly engages the time and effort of a contractor whose primary purpose is to perform an identifiable task rather than to furnish an end item of supply" [Ref. 7]. Within the Federal Government and Department of Defense, logistics services are somewhere in between the two definitions.

The recent surge in the use of services is not limited to the Federal Government as evidenced by the fact that the U.S. economy is rapidly becoming service oriented as well. The Council of Logistics Management estimates that the service economy is \$2.9 trillion [Ref. 8]. The Federal Government has experienced corresponding growth in service contracting. Between fiscal year 1990 and fiscal year 2000 service contracts increased by almost 25 percent. Currently, services account for approximately 43 percent of Federal contracting expenses. An important note on the increased use of service contracts is that it coincides

with a 21 percent decrease in the Federal workforce from 1990 to 2000 [Ref. 18].

Logistics services are composed of many varied activities and the researcher has compiled a list in order to help determine classifications for each with respect to the Department of Defense. The following list is by no means complete and can and will overlap in some cases, however, these are the services that the researcher has chosen to utilize in order to determine a classification scheme for logistics services:

- Audio visual services
- Photographic processing
- Arts and graphics services
- Information technology - facilities management
- Information technology - equipment, installation, operations and maintenance
- Information technology - programming, design and analysis
- Food service operations
- Vending machine services
- Base camp maintenance
- OSHA services
- Machine, carpentry and electrical services
- Plumbing, air conditioning and heating services
- Fire prevention/protection services
- Custodial and Janitorial services
- Refuse collection and processing
- Financial and payroll services
- Word processing and data entry services
- Financial auditing services

- Material management
- Supply services
- Laundry and dry-cleaning services
- Mapping and charting services
- Training
- Base communication services
- Printing and reproduction services
- Landscaping
- Security
- Bus/shuttle services
- Motor pool operations
- Vehicle operations and maintenance

The importance of logistics services within PBSA cannot be overstated. The Government spends about \$200 billion annually through contracts. Service contracts represent approximately half of that amount or \$100 billion. That figure is expected to increase as the Federal Government strives to achieve established performance based objectives. A classification of logistics services is intended to facilitate selection, contract administration and evaluation for PBSA contracts.

#### **E. PERFORMANCE METRICS**

A critical enabler in achieving desired performance goals is the ability to measure performance [Ref. 21].

A key indicator of a successful organization is being able to identify and measure performance. To put it more succinctly, how they use that information to support and achieve the organization's strategic plan is critical. The landscape has changed and the Government has different objectives for the future and PBSA is a big part of that

future. In order to achieve PBSA goals, it is imperative that there be guidance to establish achievable performance standards that monitor and measure the effectiveness of logistics services. Metrics are a feedback mechanism that measures an organization's progress towards stated goals. Metrics are aggregated using one, or more of the constituent elements, to a common "set" of performance elements. In layman's terms, the metrics are the things needed to assess performance, be it schedule, cost or performance. Typically, the Government uses metrics that are quantifiable or definitive in a concrete way that describes the health and efficiency of a program traceable to the constituent measures.

Performance Measurements tend to be broad, generic assessments of general performance, vice specific activity seen in metrics. Measures are individual, or constituent parts, typically with a correlation.

Performance metrics are an important aspect of PBSA, however, there are no standard metrics or measurements with which to evaluate PBSA contracts. The Procurement Executives Council was chartered to develop a Government wide acquisition performance measurement program [Ref. 4]. The guiding principles that this group chose were aligned very well with many of the tenets that are incorporated into the PBSA vision. The guiding principles for the overall Performance measurement framework are [Ref. 4]:

- Be consistent with the Federal Acquisition Regulation vision.
- Respect agency performance measurement structures.



- Promote improvement, benchmarking, sharing, and linkages to strategic plans, etc.
- Achieve a balance framework.
- Stimulate a progression from procurement to acquisition.
- Consider historical baselines.
- Perform annual reviews and updates.

The performance metric objectives of PBSA could be described as follows [Ref. 5]:

- Institutionalize requirements definition process for services.
- Allow processes to mature with the quality of data elements.
- Develop quantitative planning elements.
- To have feasible, stable, and well-understood user requirements.
- Define a set of success criteria.
- Have an acquisition strategy consistent with risk level.
- Develop working models to depict risk/performance relationships.
- Have metrics to monitor the effectiveness of risk mitigation strategies.

Basically, the Government has to define an evaluation methodology that enables some form of value analysis. The intent is to provide industry with sufficient understanding of the Government's requirements to develop business strategies, build teaming relationships, and propose performance benefits that can be quantifiably measured.

A better understanding of performance metrics is necessary in order to apply appropriated measures correctly. The bottom line is that the Government is looking to do more with less and do it better, faster and

cheaper. However, "you can't improve what you can't (or don't) measure" [Ref. 21]. As recommended by the Performance Measurement committee, the following guiding principles for measurement selection should be considered when developing metrics for PBSA [Ref. 4]:

- Limit the number of measures - less is more.
- Accommodate existing data systems.
- Be results oriented vice process oriented.
- Establish goal(s) and benchmarks for each measure as much as possible.

Performance measures are not always obvious and do not come in neat little boxes. However, all is not lost as it is common practice to classify what is being measured and the goal the metric is striving to attain. There are many types of metrics and they are generally categorized as baseline, trending, control and diagnostic metrics [Ref. 21].

Baseline performance metrics are probably the most important when developing metrics. They are the starting point from which to measure the current performance and allow for an objective determination and basis with which to provide assessment and enable improvement [Ref. 21]. Baselines can be difficult to capture but without a baseline you cannot measure improvement.

Trending performance metrics enable an activity to compare performance over a designated period of time [Ref. 21]. The object is to analyze trends and compare them to the baseline for an improvement determination.

Control Performance Metrics signal whether or not an activity is meeting objectives as set forth in the

establishment of key performance metrics [Ref. 21]. Control performance metrics are a feedback mechanism that acts as a signal flag and allows an organization to monitor specific performance or general.

Diagnostic Performance Metrics can and will provide clarification in the form of answers to trends, both positive and negative [Ref. 21]. Diagnostic metrics help determine why a specific metric is causing an undesirable outcome. Diagnostic measures can be made up of trending and control type metrics as they can assist in identifying specific changes.

In order to achieve the objectives of PBSA, contracting organizations must be able to measure or evaluate performance against the stated goals. By using these types of metrics in conjunction with one another to measure and evaluate performance, an organization is capable of recognizing trends, identifying potential problems and taking necessary actions to correct deficiencies. The bottom line is that solid performance measure can help an organization achieve its goals.

#### **F. SUMMARY**

It is important to understand the recent emphasis on PBSA. As mentioned, the Federal Government spends over \$200 billion and half of that is on services. Downsizing has impacted the way services are procured and has resulted in outsourcing to stem the tide. Reductions in requirements that are resource constrained can mean less oversight for the Government (Insight vs. Oversight). In addition, there have been significant savings, increased competition and improved innovation resulting from PBSA initiatives. As

the Department of Defense moves forward in this era of acquisition reform and the Revolution in Military and Business Affairs, PBSA will continue to be a major factor in the way that the Government conducts procurement business.

The next chapter will discuss classification schemes in order to give the reader a basic understanding of why they are important and how they apply in relation to the Federal Government, specifically logistics services.

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### **III. CLASSIFICATION**

#### **A. INTRODUCTION**

To describe the structure and relationship of the constituent objects to each other and to similar objects, and to simplify these relationships in such a way that general statements can be made about classes of objects [Ref. 22]

This research will attempt to analyze and address a classification scheme for logistics services. It is important to understand the basic principles of classification, and as such the basic definitions for both classification and classification systems. This chapter will discuss definitions, why things are classified, the types of classifications, and Government classification systems.

The origins of the science of classification date back to the ancient Greeks and were necessitated by the need to bring order and systematic arrangement to objects and ideas. The theory of classification submitted by Plato and further developed by Aristotle was based on the following assumptions: (1) a universal order exists in nature; (2) this order, when discovered, will permit carving nature into natural classes to yield a permanent conceptual framework that consists of a hierarchy of genus, species, and subspecies progressing from general to specific; (3) the principle of differentiation that operates in the hierarchy is derived from similar attributes; and (4) the properties concerned are of the substantive nature of the units being classified [Ref. 23].

Plato and Aristotle dealt with classification of biology; however, classificatory science has been applied to many other areas. Contracting falls into the realm of a social science and "...it is relevant to apply classifications from other social science studies to classification of Government procured services" [Ref. 24]. Classification schemes fulfill the role of organizing phenomena into recognizable and like groups that fit into a pre-determined situation.

## **B. DEFINITIONS**

**Classification** is the ordering of arrangement of entities into groups or sets on the basis of their relationships, based on observable or inferred properties [Ref. 22].

**Classification system** is the end result of the process of classification [Ref 22].

The definition for a classification system is somewhat limited and requires some clarification. All classification systems involve partitioning some universe of objects, events, or other phenomena into categories that are homogeneous with respect to the selected characteristics. However, there are two general approaches for generating classification schemata, which in turn impacts the applications for which they may be used. The different approaches are logical partitioning and grouping [Ref. 25].

## **C. WHY WE CLASSIFY**

Classification is a part of our everyday lives and we do it consciously and unconsciously each and every day. However, in attempting to create order in a chaotic

environment it is necessary to understand the complexities of categorization and reasons why we classify.

The paramount purpose of a classification is to describe the structure and constituent objects to each other and to similar objects, and to simplify these relationships in such a way that general statements can be made about classes of objects [Ref. 22].

With that in mind, classifications are generally used to achieve four subordinate objectives and they are: (1) economy of memory; (2) ease of manipulation; (3) ease of retrieval of information; and (4) description of the structure and relationship of constituent objects [Ref. 22].

Economy of memory is achieved by classifying many individual objects into a category that groups individual descriptions of those objects contained within it [Ref. 22]. For example, it is much easier to remember the basic characteristics of species of animals rather than to remember the characteristics of each individual animal within the category.

Ease of manipulation is achieved by classifying, in that objects are arrayed in systems of a set of categories and can be easily identified and related to each other [Ref. 22]. If the relationships are very complex, the labeling or handling of the classification schemes can become extremely difficult.

Ease of information retrieval becomes paramount when dealing with complex systems and should always be a consideration [Ref. 22].



Describing the structure and relationships of the constituent objects is the most important objective of classifying. Due to the fact that these relationships can be simplified in order to derive basic statements regarding the classes of objects, classification theory enables us to make basic assumptions, hypotheses and decisions based on the structure and relationships [Ref. 22].

#### **D. CLASSIFICATION SCHEMES**

As mentioned earlier there are generally two different procedures for developing classification schemes: logical partitioning and grouping.

Logical partitioning is also referred to as deductive or a priori classification [Ref. 25]. The important aspect of this type is that the researcher develops a classification scheme prior to analyzing a specific set of data. The process begins with the specification of the phenomena, in this case, activities and the associated performance metrics, which require classification. The next step is to delineate the properties or characteristics upon which the classification scheme is based. The final step is to apply labels to the various categories that are developed from applying the properties or characteristics to the phenomena [Ref. 25].

Grouping is the second approach and it is also referred to as inductive, quantitative, ex post, or numerical classification. The important distinction here is that the classification scheme is generated only after data have been analyzed. Grouping is similar to logical partitioning in that the first step is to specify the phenomena and the respective properties or characteristics

to be classified. However, unlike logical partitioning, all grouping procedures determine categories after the analysis of a specific set of data. [Ref. 25]

#### **E. GOVERNMENT CLASSIFICATION SCHEMES**

Within the Federal Government, there are three classification schemes that are used for categorizing *goods*. The Federal Supply Class (FSC), the Standard Industrial Classification (SIC) code and the newly created North American Industry Classification System (NAICS) are the only ones used. They are primarily used for goods. There are other listings that are widely used within the Federal Government and while they are not specifically designed as classification schemes they still serve the purpose of classifying services. They are the Office of Management and Budget (OMB) circular A-76 and the FAR. The Federal Government uses an assortment of methods for classifying goods and services. For the purpose of clarification the following overview is provided.

The FSC is a commodity classification that categorizes goods into groups and classes established by currently known items in the supply systems of the Federal Government. There are 78 groups that are subdivided into approximately 700 classes. The primary criterion for inclusion into one of the classes is the good's physical or performance characteristics. Obviously, like items that are grouped together are included in the same class for supply management purposes [Ref. 26].

Table 1 represents categories of service contracts based on the appropriate FSC code and description [Ref. 27].

<u>Service code</u>	<u>Description</u>
A-	Research and Development
B-	Special Studies and Analyses--Not R&D
C-	Architect and Engineering Services--Construction
D-	Information Technology Services
E-	Purchase of Structures and Facilities
F-	Natural Resources and Conservation Services
G-	Social Services
H-	Quality Control, Testing and Inspection Services
J-	Maintenance, Repair, and Rebuilding of Equipment
K-	Modification of Equipment
L-	Technical Representative Services
M-	Operation of Government-Owned Facilities
N-	Installation of Equipment
P-	Salvage Services
Q-	Medical Services
R-	Professional, Administrative and Management Support Svcs
S-	Utilities and Housekeeping Services
T-	Photographic, Mapping, Printing, and Publication Services
U-	Education and Training Services
V-	Transportation, Travel and Relocation Services
W-	Lease or Rental of Equipment
X-	Lease or Rental of Facilities
Y-	Construction of Structures and Facilities
Z-	Maintenance, Repair or Alteration of Real Property

Table 1. Summary of Service Codes.  
After: Ref. [27]

The SIC code is based on classifying products or goods according to the structure of the U.S. economy with each unit classified within a SIC representing a particular business establishment in the economy. The SIC can be used to classify goods by manufacture [Ref. 28].

The North American Industry Classification System (NAICS) is a new industry classification system. It became effective 1 January 1997 and will eventually replace the SIC. Representatives from the United States, Mexico and Canada developed the NAICS jointly. The NAICS groups

together economic units with similar production processes [Ref. 29].

OMB Circular A-76 set forth guidance and procedures for determining whether commercial activities should be outsourced or contained within using Government resources such as facilities and personnel [Ref. 20]. There are certain functions that are considered "inherently Governmental" in nature in that they are so intimately related to the interest of the public that they mandate performance only by Federal employees. The Government relies on the competitive private industry to supply the products and services it requires. It can be argued that all of the services performed by the Federal Government could be provided by commercial sources within industry. OMB Circular A-76 lists a number of service classes that can be outsourced. Appendix B contains the services identified in A-76.

This list of services is by no means exhaustive but includes examples of commercial activities currently operated in-house by Federal agencies or placed under contract. It is also the most detailed classification with the intent of monitoring conformance with the Commercial Activities Program. This is the classification system that the researcher used to classify logistics services for the purpose of this research effort.

The Federal Acquisition Regulation (FAR) also provides a general listing of some of the areas where service contracts may be used to acquire services. The listing of FAR categories below is intended to group services according to Federal statutes and regulations [Ref. 30]:

- Maintenance, overhaul, repair, servicing, rehabilitation, salvage, modernization, or modernization of supplies, systems, or equipment.
- Routine recurring maintenance of real property.
- Housekeeping and base services.
- Advisory and assistance services.
- Operation of Government-Owned equipment, facilities, and systems.
- Communications services.
- Architect-Engineering.
- Transportation and related services.
- Research and Development.

These categories of service contracts represent a wide spectrum of the services procured by the Federal Government but are not all encompassing.

#### **F. SUMMARY**

This chapter presented a broad picture of classification and the different classification systems within the Federal Government. It highlighted the fact that existing Government classification systems such as FSC, SIC and NAICS were more tailored towards goods rather than services. OMB Circular A-76 and the FAR represented more realistic ideas of the typical services utilized by the Federal Government and will help to determine the proper classification scheme for logistic services as related to PBSA.

The next chapter will be a presentation of the data. Specifically, the rationale for using the framework established by Allen for the classification of services and why the researcher chose to add or omit certain associated features. Additionally, the characteristics, scale and

boundary range are discussed for the classification model as well as any observations by the researcher.

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## IV. OVERVIEW OF DATA

### A. INTRODUCTION

In this chapter, the researcher will explain how the data collection process was conducted. The basis for the data was a continuation of the effort conducted by Scott Allen, a Naval Postgraduate School graduate. His thesis, entitled "A Taxonomical Structure For Classifying The Services Procured By The Federal Government" focused on developing a taxonomical scheme that acquisition professionals within the Federal Government could use to classify services. Additionally, Allen sought to determine what characteristics were appropriate for classifying services on a strategic basis [Ref. 3].

Allen determined potential characteristics for his classification effort mostly from available literature. He then applied a filtering process in order to develop a list of candidate characteristics. This list was submitted to subject matter experts with a broad range of experience in the acquisition profession in the form of a survey. Allen received feedback that allowed him to refine his list of characteristics. These characteristics were defined and differing degrees of application to services were quantified using ordinal scaling for each characteristic. Ultimately, Allen selected twelve characteristics in which to use for his classification scheme. The researcher decided that for the purpose of this research effort, that the twelve characteristics that Allen developed for assisting in the classification of services were suitable for the researchers' selected services.



The data collection package (Appendix A) for this thesis, which consisted of a cover letter, instructions, and characteristic definitions and scales, was developed by Allen. The researcher incorporated the logistics services he selected with the characteristics developed by Allen to evaluate Allen's original classification scheme. The result was a list of thirty different services, specifically, logistics services that the researcher endeavored to evaluate based on respondents input. In addition, the researcher has developed a number of appendices created from the raw data collected. Each of these appendices will help to provide useful information and support related analysis.

## **B. DEFINITIONS OF CHARACTERISTICS**

The following characteristic definitions are designed to classify services on a strategic range, from the relatively simple to the complex. As previously mentioned, the characteristics and scales were found to be appropriate for this body of work. Despite the number of years since Allen developed these characteristics to help classify services, they are appropriate for helping to classify the logistics services chosen by the researcher.

1. **Customization** is the degree to which the production of a service is modified from standard commercial practice to conform to a buyer's unique specifications. All services are modified to some degree in consideration of circumstances unique to each customer, but they will differ on the magnitude to which important procedures, or the entire service process, are exceptionally customized for a buyer. In general, a greater degree of customization will increase the amount of buyer attention, and contract cost, necessary to ensure successful service performance.

2. **Expertise** is the degree of professional certification, skill, and experience required of the principal service production personnel to produce a service at an acceptable quality level. Higher levels of required expertise will usually increase the difficulty of evaluating service performance, as well as the extent to which a buyer should validate the qualifications of service provider personnel.

3. **Complexity** is the degree of technical complexity of techniques or equipment used in the scope of service production. Typically, a high degree of technical complexity will require that a buyer devote substantial attention to evaluating the skill level or equipment required to produce a service, as well as evaluating potential providers for those capabilities.

4. **Labor Percentage of Cost** is the degree to which total service cost is expended on provider labor (as opposed to material and equipment). The proportion of labor to material and equipment required to perform a service should affect buyer validation of provider qualifications, especially in the realm of financing.

5. **Measurability** is the degree of effort necessary to describe and measure acceptable service performance. While performance of some services is obvious and readily measured, others may necessitate extensive description and detailed review by a buyer to determine if service performance satisfies buyer requirements.

6. **Confidentiality** is the degree to which release of information produced by, or required to produce; a service may be detrimental to either the buyer or service provider. The magnitude of potential damage, whether it is financial, competitive, related to reputation, or to national security, from a release of service information determines the level of service confidentiality. A high grade of confidentiality should necessitate extensive buyer validation of provider qualifications for controlling confidential information.

7. **Risk to the Government** is the likelihood and magnitude of potential harm to the Government that would result if a service were not completed in accordance with cost, schedule, or performance specifications. Buyer attention should increase throughout the entire procurement process as the degree of risk to the Government escalates.

8. **Buyer Attention** is the degree of time and effort that buyer personnel typically dedicate to procuring a service. Personnel allocation, work assignments, and other buyer organization plans and policies should vary with the distinctive degree of buyer attention customarily required by different types of services.

9. **Negotiation** is the degree to which price, schedule, and performance criteria are discussed and adjusted by the buyer and potential service providers during the service procurement process. More negotiation will generally require a longer and more detailed procurement effort.

10. **Competition** is the degree to which multiple, autonomous providers are willing and able to produce a service. Typically, the intensity of competition will influence buyer selection of contract type, as well as the extent to which price is the dominant source-selection factor.

11. **Stability** is the degree to which important schedule and performance criteria of a service remain the same over a period of time. A more stable service will typically require less attention on the part of the buyer.

12. **Perishability** is the length of time that the product of service performance is beneficial to, or consumed by, the buyer organization. A service with a relatively high degree of perishability will be consumed almost instantaneously, while the product of other services may provide benefits for many years. [Ref. 3]

### C. SCALING THE CHARACTERISTICS

The researcher also adopted the scaling methodology utilized by Allen in order to allow respondents to quantitatively judge the presence of service characteristics. The main reason for adopting this method was its simplicity and also, the fact that it had proved to be an effective tool for Allen's effort. Allen reasoned that this method would facilitate ease of scoring and a better understanding of the material. In addition, Allen sought to define the scales so that ascending values would coincide with greater strategic complexity, on a range from simple to complex. A danger associated with many of the scales was that some might appear to be counter-intuitive.

For example, a scoring of "5" for the characteristic measurability might intuitively denote to many that a service is very measurable. A very measurable service, however, may typically be very simple. In order to produce a scale that makes a "5" typical of a very complex service, the scale may have to be counter-intuitive [Ref. 3].

Allen proposed two methods to counteract the danger of scaling the counter-intuitive characteristics:

- Scale counter-intuitive characteristics according to a presumably intuitive order, and reverse their values when computing mean values on a range of simple-to-complex, or;
- Warn respondents through implicit instructions that scales may appear to be counter-intuitive, and clearly label the scales as such.

Allen chose the latter method due to the fact that it would directly label instructions and scales, without the need for reversing the scale values during computations.

For these very same reasons, the researcher selected the second method also.

The following is a list of the twelve scales used to support this research effort.

### **1. Customization**

Scale:

- 1 No customization
- 2 Customization does not substantively alter service production
- 3 Customization substantively alters a few important elements of service production
- 4 Customization substantively alters the bulk of important elements of service production
- 5 The service is produced exclusively for the Government

### **2. Expertise**

Scale:

- 1 No expertise needed by principal service production personnel
- 2 Expertise needed requires brief or inexpensive training/qualification
- 3 Expertise needed requires moderately lengthy or moderately expensive training/qualification
- 4 Expertise needed requires very lengthy or very expensive training/qualification
- 5 Expertise needed requires extremely lengthy or extremely costly training/qualification

### **3. Complexity**

Scale:

- 1 Technical complexity is rudimentary
- 2 Technical complexity is modest
- 3 Technical complexity is sophisticated
- 4 Technical complexity is advanced
- 5 Technical complexity is on the frontier of

human knowledge and capabilities

#### **4. Labor Percentage of Cost**

Scale:

- 1 A modest amount of total service cost is expended on labor
- 2 A moderate amount of total service cost is expended on labor
- 3 The bulk of total service cost is expended on labor
- 4 The vast preponderance of total service cost is expended on labor
- 5 Almost all of total service cost is expended on labor

#### **5. Measurability**

Scale: *NOTE - SCALE MAY APPEAR TO BE COUNTER-INTUITIVE*

- 1 Description and measurement of acceptable service performance is obvious and almost effortless
- 2 Description and measurement of acceptable service performance is uncomplicated
- 3 Description and measurement of acceptable service performance is moderately difficult
- 4 Description and measurement of acceptable service performance is quite complex
- 5 Description and measurement of acceptable service performance is profoundly perplexing and intricate

#### **6. Confidentiality**

Scale:

- 1 Release of service production information is not at all potentially detrimental to the provider or Government
- 2 Release of service production information would potentially cause inconsequential damage to the provider or Government
- 3 Release of service production information would potentially cause notable damage to the

provider or Government

4 Release of service production information would potentially cause extensive damage to the provider or Government

5 Release of service production information would potentially cause enormous damage to the provider or Government

## **7. Risks to Government**

Scale:

1 The likelihood and magnitude of potential harm to the Government due to service performance failure is insignificant

2 The likelihood and magnitude of potential harm to the Government due to service performance failure is slight

3 The likelihood and magnitude of potential harm to the Government due to service performance failure is modest

4 The likelihood and magnitude of potential harm to the Government due to service performance failure is substantial

5 The likelihood and magnitude of potential harm to the Government due to service performance failure is enormous

## **8. Government (Buyer) Attention**

Scale:

1 Service procurement requires inconsequential time and effort from buyer personnel

2 Service procurement requires minor time and effort from buyer personnel

3 Service procurement requires moderate time and effort from buyer personnel

4 Service procurement requires considerable time and effort from buyer personnel

5 Service procurement requires extraordinary time and effort from buyer personnel

## **9. Negotiation**

Scale:

1 There is no negotiation between buyer and potential providers during the service procurement process

2 Negotiation is insignificant between buyer and potential providers during the service procurement process

3 Negotiation is meaningful between buyer and potential providers during the service procurement process

4 Negotiation is extensive between buyer and potential providers during the service procurement process

5 Negotiation is critical and comprehensive between buyer and potential providers during the service procurement process

## **10. Competition**

Scale: *NOTE - SCALE MAY APPEAR TO BE COUNTER-INTUITIVE*

1 Numerous autonomous providers are willing and able to produce the service and are very aggressive in their willingness to do so

2 It is quite easy to find several providers who are willing and able to produce the service

3 It is uncomplicated to find a few autonomous providers who are willing and able to produce the service

4 It is difficult to find a few autonomous providers who are willing and able to produce the service

5 It is extremely difficult to find a provider willing and able to produce the service

## **11. Stability**

Scale: *NOTE - SCALE MAY APPEAR TO BE COUNTER-INTUITIVE*

1 Any alteration to schedule or performance criteria is, at most, trivial for extremely lengthy periods of time



- 2 Important schedule or performance criteria seldom undergo significant alteration
- 3 Important schedule or performance criteria infrequently undergo significant alteration
- 4 Important schedule or performance criteria frequently undergo significant alteration
- 5 Important schedule or performance criteria almost constantly undergo significant alteration

## **12. Perishability**

Scale: *NOTE - SCALE MAY APPEAR TO BE COUNTER-INTUITIVE*

- 1 The period of benefit/consumption is immediate
- 2 The period of benefit/consumption is brief
- 3 The period of benefit/consumption is moderate
- 4 The period of benefit/consumption is lengthy
- 5 The period of benefit/consumption is extremely lengthy [Ref. 3]

## **D. CATEGORY BOUNDARIES AND TITLES**

The categorical boundary ranges for the researcher's classification differed from that of the original work by Allen. Allen used a mid-point method to determine the boundaries. Allen's boundaries were established by finding the mid-point between the highest service mean value of one category and the lowest of the next. Allen adjusted the mid-point values slightly so that they would be evenly divisible by five. The ranges for Allen's model were 1.35 for category 1, .40 for category 2, .45 for category 3, .50 for category 4, and 1.30 for category 5. Categories 1 and 5 were larger than the other categories due to the fact that they were extremes in the scheme [Ref. 3].

The researcher chose to employ an even width methodology due to the clustering structure of the data and the number of services and characteristics. Additionally, because of the subjectivity involved in scoring the services, the boundaries for the various categories are not intuitively obvious except for the most extreme cases. This was computed by dividing the number of categories (five) by the number of boundaries between the categories (four). The result was a range of .80 and that range applies to the values derived for each of the twelve characteristics and each services overall score.

In order to yield a scheme that was somewhat self-explanatory, the researcher opted to use the same category titles as those used by Allen.

Since the classification effort was based on a range from those services that are simple to procure to those that are quite complex, the appropriate titles would describe and distinguish the services in each category across this spectrum. [Allen, 1991, p. 169]

The category titles used were "Non-complex", "Basic", "Intermediate", "Advanced", and "Complex". The researcher concluded that these titles were self-explanatory and would be sufficient in differentiating each service for classification purposes.

#### **E. SURVEY RESPONSES**

In order to allow for a more robust analysis of the raw data collected and to assist in classifying the importance of each service, the researcher computed and created: (1) a mean value matrix (Appendix C), (2) individual service classifications for each of the thirty sample services (Appendix D), (3) bar charts for individual

service classifications (Appendix E), (4) bar charts for groups of service classifications (Appendix F), (5) A mean value bar chart for all services by characteristic (Table 13), and (6) frequency charts (Tables 14 through 18 of Chapter IV) for determining what the top three strategic priorities should be based on respondents' input. Tables 2 through 32 were developed as a result of the researcher's analysis.

The mean value matrix was computed in an Excel spreadsheet and is displayed as Table 2. The researcher calculated the sum of each of the responses for each service and characteristic. The individual sums were divided by the total number of surveys (N=27) and resulted in a mean value. These matrices related the respondent's score for the individual service on the vertical axis with each of the twelve characteristics along the horizontal axis. After subdividing the 27 completed survey responses in this fashion, they were all recombined into a completed matrix by averaging the individual cell scores.

The individual service classifications for each of the thirty services are depicted in Appendix D. Table 3 is an example of an individual Service Classification Scheme.

	MEAN VALUE MATRIX											
Service	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
Audiovisual	1.78	2.41	2.15	2.67	2	2.15	2.11	2.22	2.26	1.74	1.7	2.7
Photographic processing	1.59	2.18	2.11	2.41	1.59	2.48	2.07	2.11	2.22	1.81	1.78	2.3
Arts & Graphics	2.11	2.56	2.3	2.74	2	2	2	2.15	2.3	1.93	1.81	2.67
IT Facilities Management	2.85	3.11	3	3.26	2.7	3.22	3.81	3.56	3.48	2.15	3.07	3.56
IT Equip, Install, Ops & Mntnce	2.7	3.37	3.22	2.67	2.89	3.22	3.74	3.81	3.63	2.11	3.22	3.56
IT Programming, design & analysis	3.56	3.93	3.78	3.85	3.41	4	3.63	4	4	2.3	3.22	3.85
Food Service ops	2.04	1.89	1.59	3.56	1.96	1.07	2.19	2.63	2.59	1.93	1.85	2.15
Vending Machine ops	1.56	1.37	1.26	2.67	1.37	1.04	1.63	1.52	1.89	1.59	1.48	2.22
Medical & Dental	2.07	4.04	3.11	3.3	3	2	3.41	3.26	3.04	2.74	2.15	3.07
OSHA	1.85	2.96	2.11	3.33	2.81	1.78	2.67	2.37	2.07	2.7	1.81	2.48
Machine, carpentry & electrical	1.63	2.3	1.81	3.11	2.52	1.29	2.56	2.3	2.33	1.67	1.93	3.07
Plumbing, AC & Heating	1.63	2.59	1.89	2.88	2.3	1.29	2.52	2.33	2.33	1.67	1.93	3.19
Fire prevention/protection	1.81	2.81	2	3.19	2.44	1.44	3.7	2.59	2.67	2.26	1.96	2.7
Custodial/Janitor	1.44	1.3	1.15	3.44	1.7	1.18	2	2.22	2.59	1.59	2.15	2.37
Refuse Collection & Processing	1.44	1.48	1.26	3.37	1.48	1.44	2.33	2	2.18	1.63	2	2.56
Financial & Payroll	2.7	2.59	2.3	3.59	2.63	2.7	3.26	2.74	2.74	2.41	2.04	3.11
Word Processing & Data Entry	1.74	1.89	1.41	3.44	2.19	1.7	2.33	2	1.96	1.74	2	2.48
Financial Auditing	2.63	2.93	2.48	3.85	2.7	2.74	2.89	2.59	2.7	2.07	2.15	2.74
Material Management	2.56	2.37	2.47	3	2.56	2.3	3.22	2.96	2.89	2.44	2.56	3.3
Supply services	2.74	2.37	2.15	3	2.59	2.11	3.15	2.74	2.81	2.37	2.52	3
Laundry & Dry-Cleaning	1.56	1.07	1.33	3.04	1.78	1.15	1.7	1.67	2	1.7	1.89	2.04
Mapping & Charting	2.22	2.56	2.33	3.19	2.41	2.37	2.78	2.26	2.41	2.33	2.18	2.74
Training	3	3	2.3	3.63	3.26	2.44	2.85	2.74	2.89	2.41	2.48	3.07
Base Communications	2.7	2.59	2.22	2.78	2.81	2.85	3.74	3.04	2.93	2.33	2.59	3.15
Printing, copying & duplication	1.63	1.89	1.85	2.74	1.85	2.11	2.44	2.11	1.81	1.74	2.22	2.18
Landscaping	1.67	1.67	1.52	3.19	2	1.15	1.3	2.04	2.22	1.52	1.96	3
Security	3	2.63	2	3.81	2.15	3.52	3.89	2.85	2.7	2.11	2.37	3.19
Bus/shuttle	1.63	1.52	1.37	3.11	1.37	1.7	1.89	2.11	1.96	1.63	2.26	2.22
Motor pool ops	2.15	2.07	1.59	3.11	1.81	1.67	2.26	2.11	2.07	2	1.89	2.59
Vehicle Ops & maintenance	2	2.78	1.85	3	2.22	1.7	2.22	2.41	2.22	2.04	2.22	2.59

Table 2. Mean Value Matrix.

C1= Customization  
 C2= Expertise  
 C3= Complexity  
 C4= Labor % of Cost  
 C5= Measurability  
 C6= Confidentiality

C7= Risk to Govt.  
 C8= Govt. Attention  
 C9= Negotiation  
 C10= Competition  
 C11= Stability  
 C12= Perishability

	SERVICE: Audiovisual					
						N = 27
	CATEGORY					
		Non-		Inter-		
Characteristic	Avg	complex	Basic	mediate	Advanced	Complex
	Value	1.0-1.80	1.81-2.60	2.61-3.40	3.41-4.20	4.21-5.0
Customization	1.78	+				
Expertise	2.41		+			
Complexity	2.15		0			
Labor & Cost	2.67			-		
Measurability	2.0		-			
Confidentiality	2.15		0			
Risk to Govt	2.11		0			
Govt Attention	2.22		0			
Negotiation	2.26		0			
Competition	1.74	+				
Stability	1.70	+				
Perishability	2.70			-		
		Group 1 1 of 3				
Key:						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

Table 3. Service Classification Example.

The above grid is a means to display the mean scoring values and to classify each service into a particular category. The numeric values would be listed in the "Avg Value" column and a "+", "0", or "-" could be used in each of the characteristic versus category cells [Ref. 3].

A "+" would symbolize a score that fell into the upper one-third of a category, a "0" near the middle one-third, and a "-" would tend toward the lower one-third [Ref. 3].

The researcher created bar charts (Appendix E) for each of the thirty services. This was done in order to compare each of the services and to determine if there was any correlation between the characteristics and the scoring scale used for each. The vertical axis of each graph represents the associated scale while the horizontal axis represents the characteristics. An Excel spreadsheet was created to input the average value for each characteristic of each individual service. Table 4 is an example of one of the charts, however due to the number of services the rest of the charts are included in Appendix E.

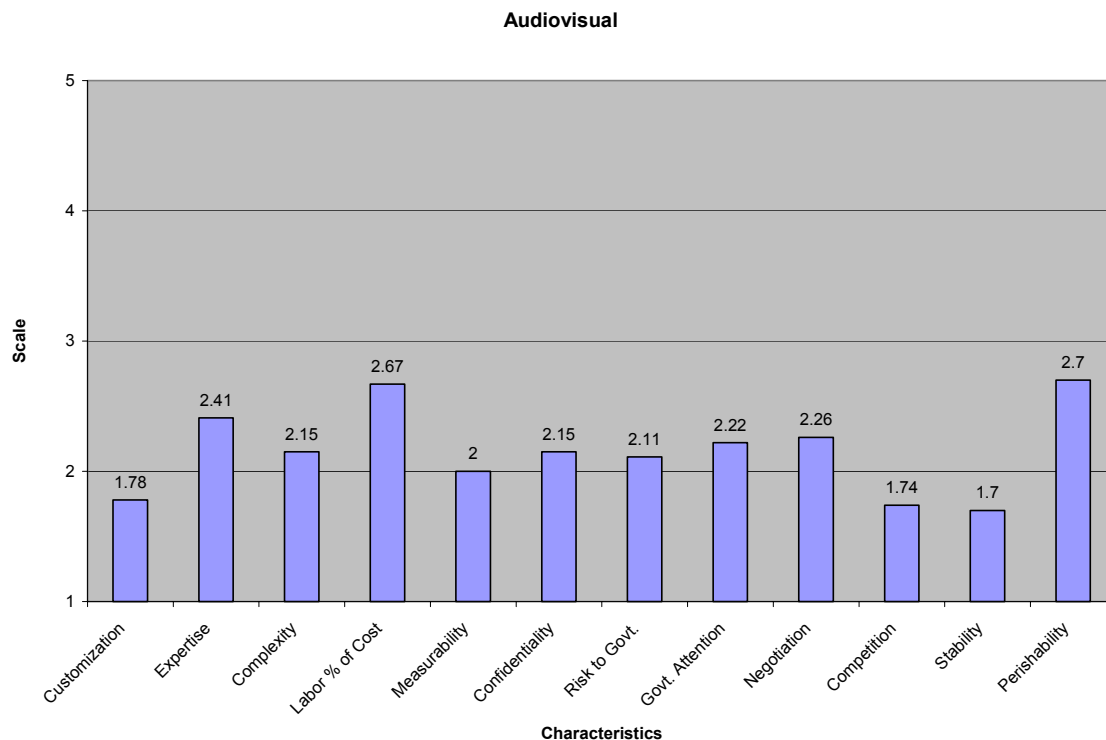


Table 4. Individual Service Bar Chart.

Following the same procedures, the researcher created additional bar graph charts for each of the separate groups of services. OMB Circular A-76 lists 17 groups of

commercial activities. From that list, the researcher chose 30 logistics services from 13 different groups. Five of the 13 groups contained only one service. The remaining eight groups had two or more services each. Each of the charts that contained more than one group is listed below in Tables 5 through 12. Appendix F presents the bar graph charts for these groups in its entirety.

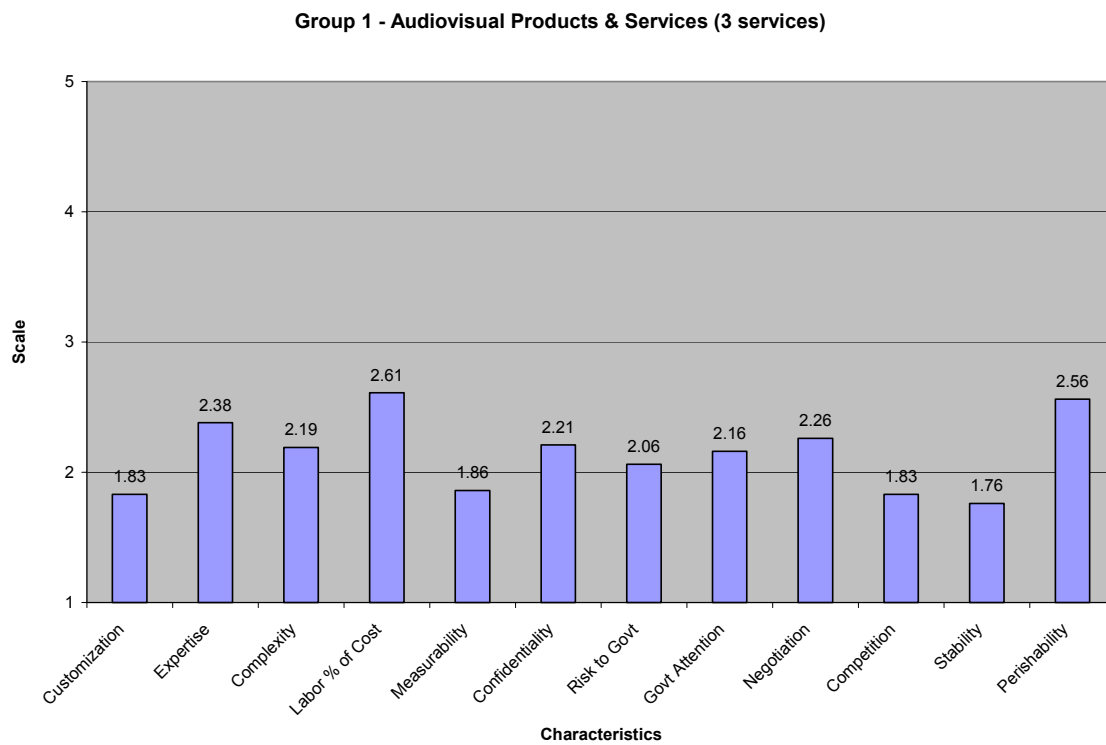


Table 5. Audiovisual Products and Services Group.

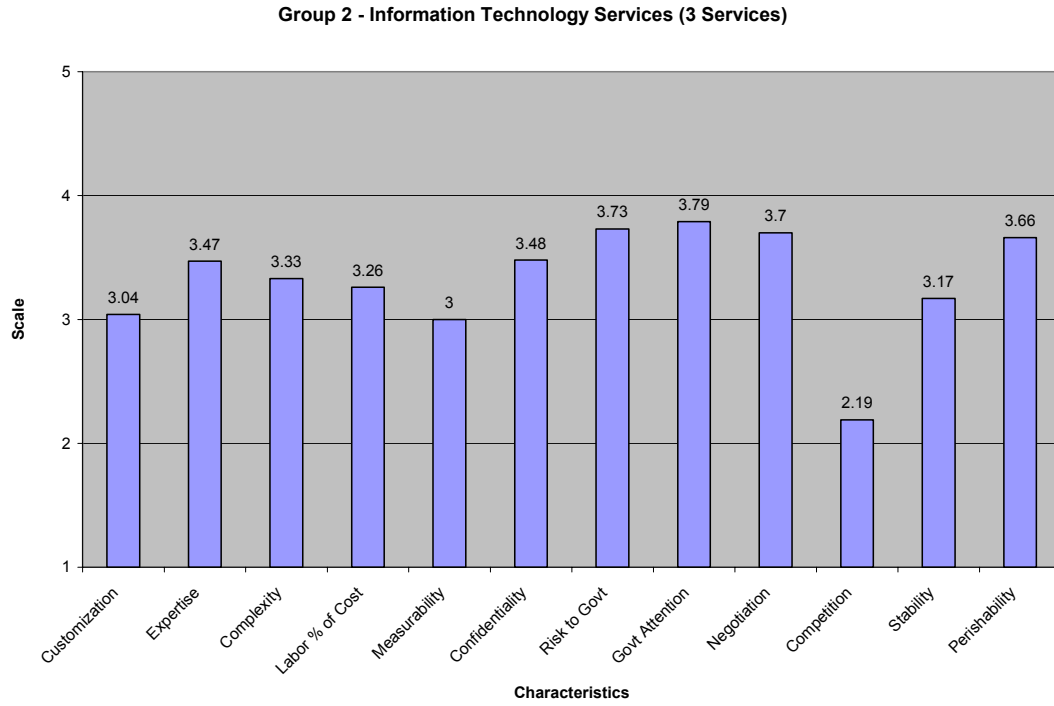


Table 6. Information Technology Services Group.

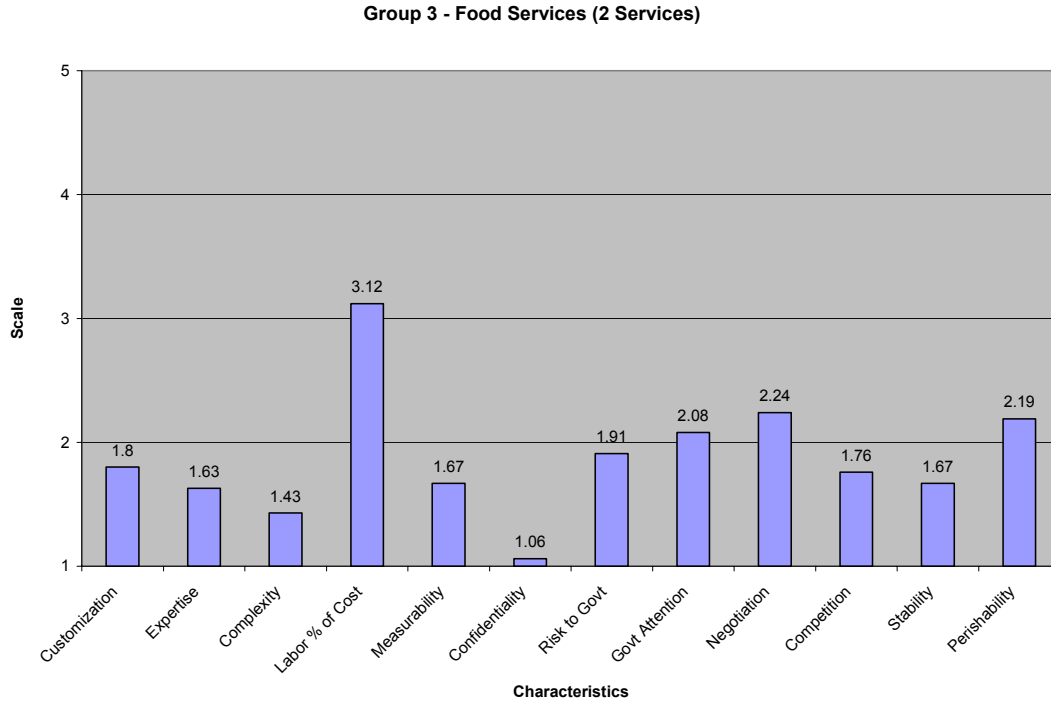


Table 7. Food services group



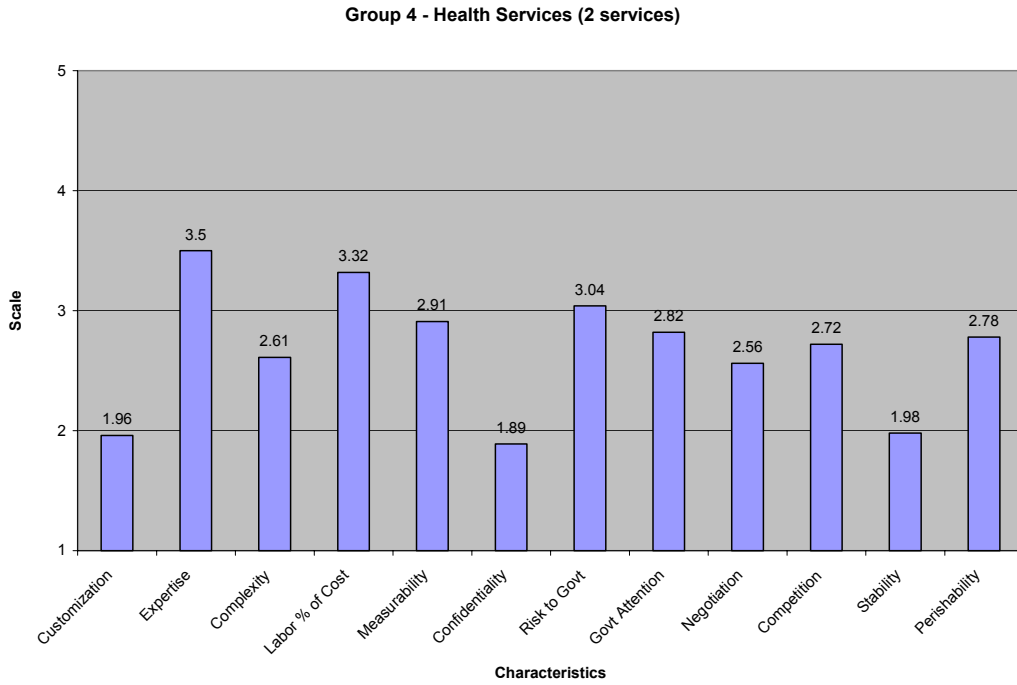


Table 8. Health Services Group.

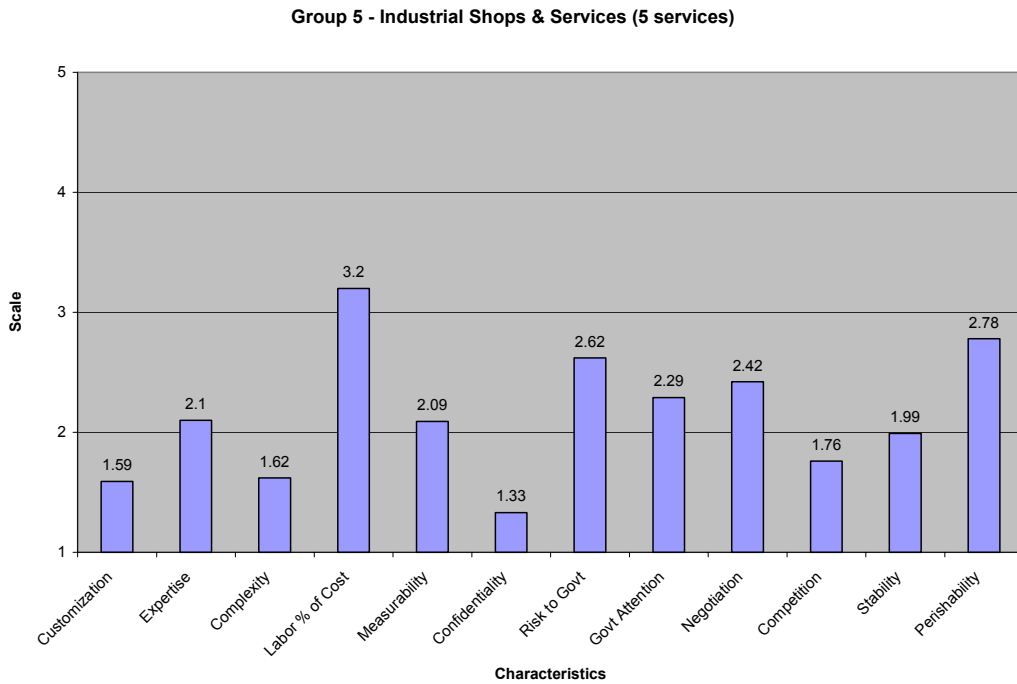


Table 9. Industrial Shops and Services Group.

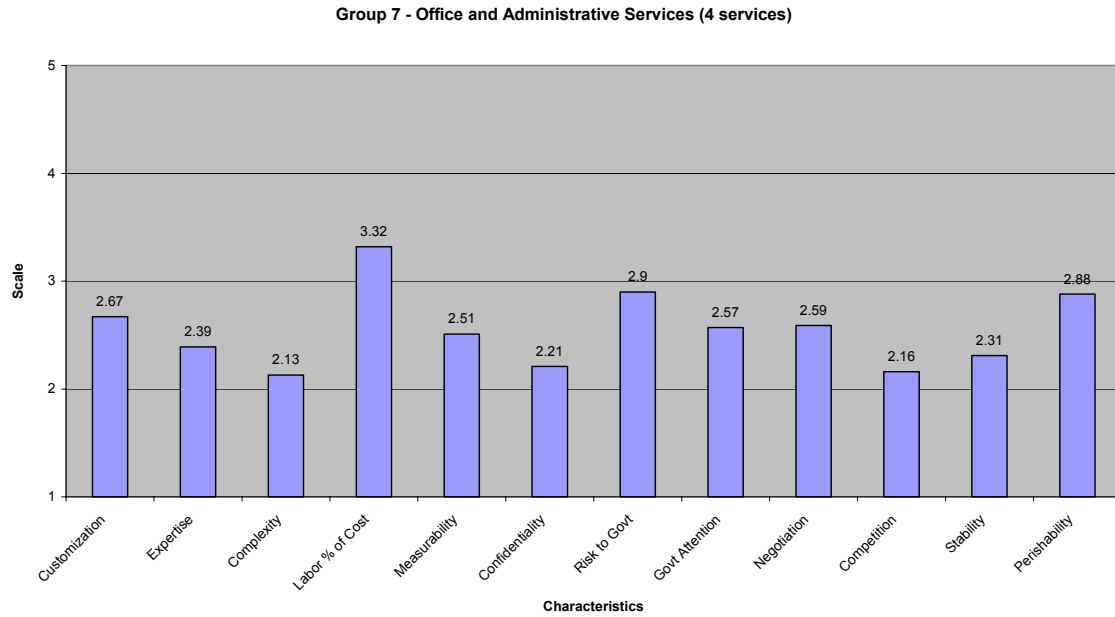


Table 10. Office and Administrative Services Group.

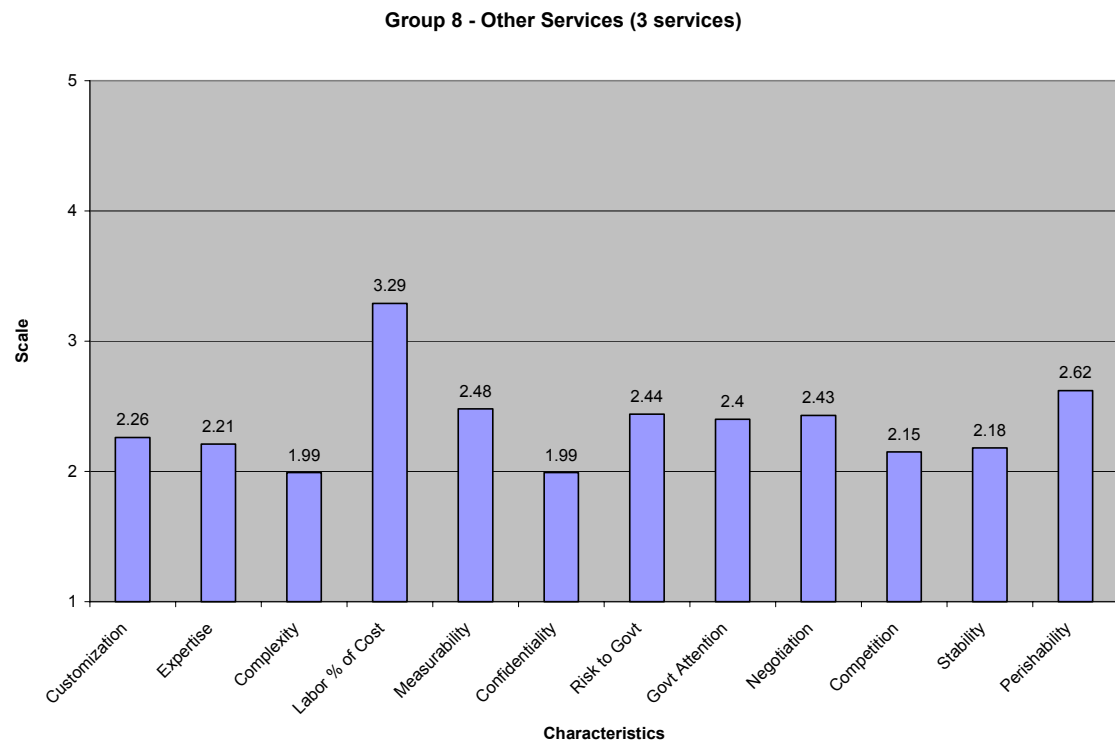


Table 11. Other Services Group.

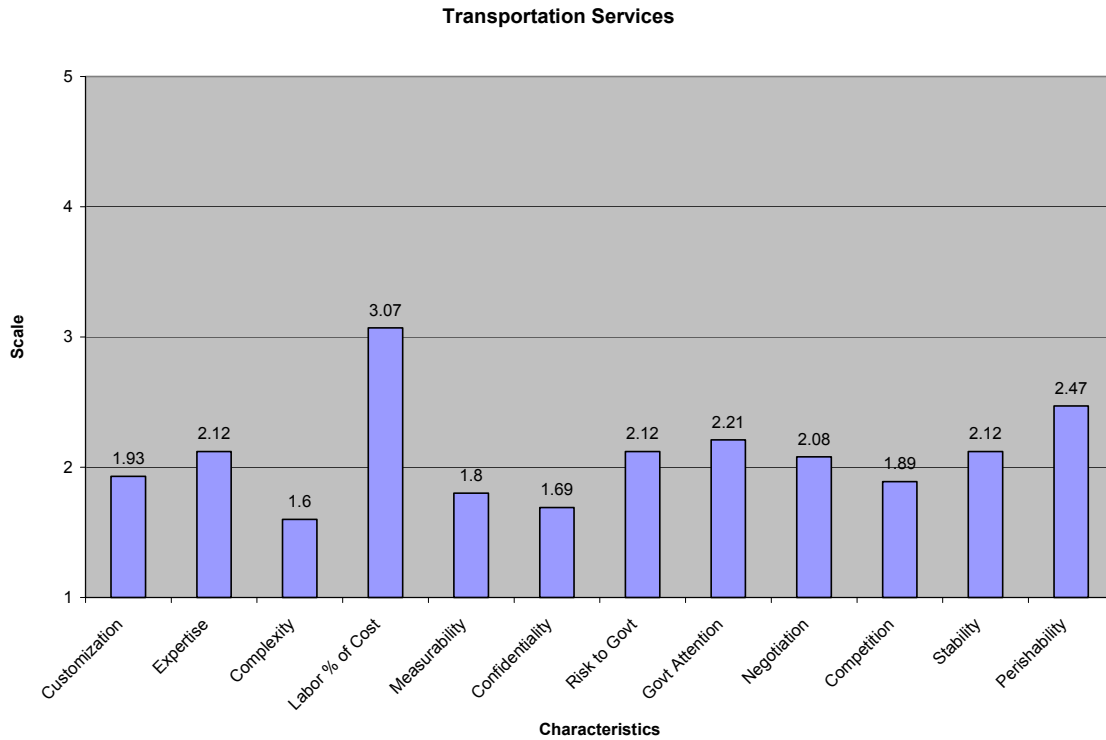


Table 12. Transportation Services Group.

Appendix G represents the mean value for all services combined by individual characteristics. Quite simply, the researcher took each of the individual services mean values, added them together and divided them by the total number of services (30). This was done for the purpose of depicting where each characteristic fell on the scale (1-5) and to compare and contrast with each individual service as well as the service groups. Table 13 presents this bar chart.

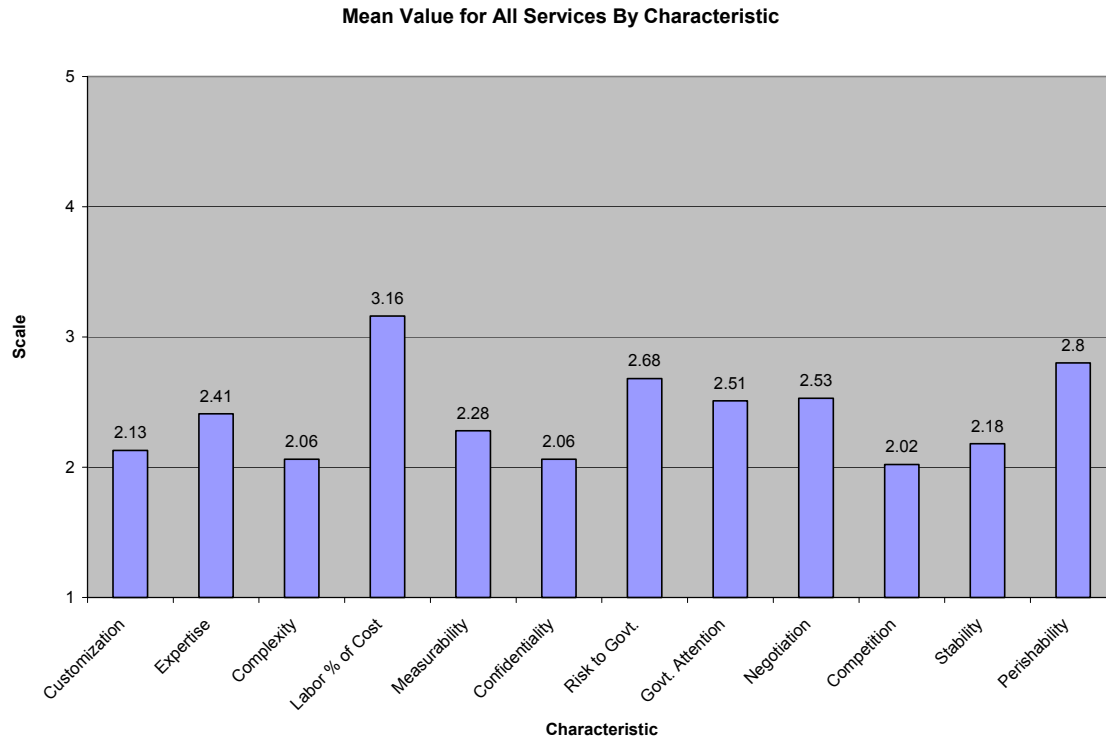


Table 13. Mean Value for All Services By Characteristic.

A key step in analyzing the different characteristics and the associated raw scores is the strategic priority rankings from the classification matrix in the data collection package. Each respondent was asked to rank in order of strategic importance the top three characteristics for each service. The researcher first calculated the number of times each characteristic was cited in first, second or third place without regard to ranking for each service and combined them together to determine the total frequency. This was an "unweighted" total, simply meaning that the sums of each were given an equal weight of one. Table 3 presents the results of these computations.

Characteristic Order Based on Frequency Cited as a Top Three Strategic Priority			
			Frequency
	Characteristic		Count
C4	Labor % of Cost		412
C2	Expertise		357
C10	Competition		293
C1	Customization		267
C5	Measurability		233
C3	Complexity		192
C12	Perishability		147
C8	Govt. Attention		137
C11	Stability		128
C7	Risk to Govt.		122
C6	Confidentiality		82
C9	Negotiation		60

Table 14. Top Three Strategic Priority.

The next step was to tabulate the frequency for each instance where the characteristic was rated first, second or third and to rank them in descending order, once again using an "unweighted" total. These data are presented in Tables 4 through 6.

Characteristic Order Based on Frequency Cited as #1 Strategic Priority			
			Frequency
	Characteristic		Count
C4	Labor % of Cost		215
C2	Expertise		150
C10	Competition		95
C1	Customization		83
C3	Complexity		73
C12	Perishability		65
C7	Risk to Govt.		37
C11	Stability		25
C5	Measurability		18
C8	Govt. Attention		17
C6	Confidentiality		17
C9	Negotiation		15

Table 15. Frequency as #1 Strategic Priority.

	Characteristic Order Based on Frequency Cited as #2 Strategic Priority		
			Frequency
	Characteristic		Count
C2	Expertise		125
C4	Labor % of Cost		120
C5	Measurability		103
C10	Competition		95
C3	Complexity		86
C8	Govt. Attention		75
C11	Stability		46
C7	Risk to Govt.		39
C6	Confidentiality		36
C12	Perishability		32
C1	Customization		27
C9	Negotiation		26

Table 16. Frequency as #2 Strategic Priority.

	Characteristic Order Based on Frequency Cited as #3 Strategic Priority		
			Frequency
	Characteristic		Count
C1	Customization		157
C5	Measurability		112
C10	Competition		103
C2	Expertise		82
C4	Labor % of Cost		77
C11	Stability		57
C12	Perishability		50
C7	Risk to Govt.		46
C8	Govt. Attention		45
C3	Complexity		33
C6	Confidentiality		29
C9	Negotiation		19

Table 17. Frequency as #3 Strategic Priority.

The next step was to formulate a weighted strategic priority ranking. The researcher assigned values of 5, 3 and 1, respectively, for the top three strategic priorities

as ranked by respondents. Using the totals from Tables 4 through 6 as the source for the respective counts, table 4-7 depicts the ranking of the weighted scores for each characteristic. This was an important step as it served to increase the visibility of those characteristics that received recognition by the respondents, but not enough to be considered an overall "number one." Rather than just recognize those characteristics that received the highest overall scores for each service, this process would ensure a fairer consideration of all the priority rankings.

Characteristic Order Based on Total Weighted Score			
			Total Weighted
	Characteristic		Score
C4	Labor % of Cost		1512
C2	Expertise		1207
C10	Competition		863
C3	Complexity		656
C1	Customization		653
C5	Measurability		511
C12	Perishability		471
C8	Govt. Attention		355
C7	Risk to Govt.		348
C11	Stability		320
C6	Confidentiality		222
C9	Negotiation		172

Table 18. Weighted Characteristic Score.

In order to further illustrate the importance of the strategic priorities, the researcher created a comprehensive table that encompassed the elements of each of the previous tables related to the top three characteristics. Table 4-8 represents the total frequency of each of the top three characteristics as well as the

unweighted and weighted totals. The characteristics were listed in the same order as they appeared on the original matrix as part of the data collection package. This consolidation allowed the researcher the opportunity to take a more holistic view of the process and also to determine if there were natural breaks in the data. This will facilitate analysis in the next chapter.

	Total Frequency of Top Three Characteristics				
	Rated	Rated	Rated	Unweighted	Weighted
<u>Characteristic</u>	<u>First</u>	<u>Second</u>	<u>Third</u>	<u>Total</u>	<u>Total</u>
Customization	83	27	157	267	653
Expertise	150	125	82	357	1216
Complexity	73	86	33	192	656
Labor % of Cost	215	120	77	412	1518
Measurability	18	103	112	233	511
Confidentiality	17	36	29	82	222
Risk to Govt.	37	39	46	122	348
Govt. Attention	17	75	45	137	355
Negotiation	15	26	19	60	172
Competition	95	95	103	293	863
Stability	25	46	57	128	320
Perishability	65	32	50	147	471

Table 19. Combined Frequency Chart

## F. SUMMARY

This chapter has detailed the data collection processes used to develop the type of rich data that will enable the researcher to conduct robust analysis. The researcher explained the survey response statistics and how they were computed. Finally, and arguably the most important part of this chapter was the data analysis preparation. The analysis preparation represented the compilation of the data and the different ways in which



they were formulated to provide useful information and support related analysis.

The next chapter will be a comprehensive analysis of the data presented in Chapter IV.

## **V. ANALYSIS**

### **A. INTRODUCTION**

This chapter will be a comprehensive analysis of the data that were presented in Chapter IV. The researcher has developed numerous charts to assist in analyzing the data and provides a cleaner look at the data rather than in its raw form. The analysis was done in three major areas. The first is an analysis of the mean value matrix and a comparison of supporting data with it. The researcher discusses the highs and lows associated with the mean value matrix as well as a comparison of the different service groups. The second area of analysis is based on the individual service classification found in Appendix C, which allowed for determining what category each service fell in as well as a comparison of the service groups. The third area of analysis is centered on the strategic priorities as characterized by respondents in the survey provided. The intent is to discuss each area and incorporate parts of the analysis together to determine trends or discover areas that may be further researched.

### **B. ANALYSIS OF MEAN VALUE MATRIX**

The important aspect of the mean value matrix (Table 2) was that it allowed the researcher the opportunity to compare each service by itself and as part of a group against the individual characteristics. At first glance, the matrix appeared to be just numbers on a page but after careful analysis, interesting information was gleaned from the 360 different mean values. In addition, the researcher used Table 13 to compare the mean values of each service against the mean values for all of the services by each

characteristic. The researcher will analyze the mean value matrix in three parts, (1) highest mean values, (2) lowest mean values and (3) a comparison of the services within service groups.

### **1. Highest Mean Value**

Information Technology (IT) programming, design and analysis services had the highest mean value for nine of the twelve characteristics. IT programming, design and analysis was rated number one (or tied for number one) in each of the following characteristics: customization, complexity, labor as a percentage of cost, measurability, confidentiality, Government attention, negotiation, stability and perishability. This was an incredibly high number considering the large number of services being evaluated. In addition, for the three characteristics in which it did not score the highest mean value, it was the second highest in one (expertise), fifth in another (risk to Govt.) and 10 for the remaining characteristic (competition). The seemingly obvious reason for the higher than average scores for this service is the continuing trend in technology advances in this, the information age that has placed enormous importance across the wide spectrum of information technology. Not surprisingly, the two other services within the Information Technology Services group scored very high across the board. In fact, the services in this group had individual mean values that were significantly higher than the mean value for all services by characteristic (Table 13). IT Facilities management and IT equipment, installation, operations and maintenance were the other two services that comprised the group of IT services. These three services ranked 1,2,3

for highest mean value in five of the twelve characteristics and were consistently in the top five for almost every characteristic. Once again, this seems to be a reflection of the importance that technology plays in society as well as within the Federal Government. The researcher expected to see high values for this service and group.

The only other service that scored the highest mean value on more than one occasion was Medical and Dental services. It had the highest mean value for expertise and competition and in nine out of twelve characteristics it was well above the mean value for all services by characteristic. Considering the fact that the individuals who work within the medical and dental services are responsible for ensuring competent healthcare for our military, it was refreshing to discover that the respondents valued expertise the most. In fact, expertise for medical and dental services was the single highest mean value for the entire survey. The other characteristic in which medical and dental services had the highest mean value was "competition." This characteristic had the lowest mean value for all services when compared against all other characteristics, which is extremely surprising given the fact that it was in the top three for almost every category for frequency counts with relation to strategic priorities.

Financial auditing had the highest mean value for the "labor as a percentage of cost" characteristic. The definition of this characteristic is the degree to which total service cost is expended on provider labor (as

opposed to material and equipment). The proportion of labor to material and equipment required to perform a service should affect buyer validation of provider qualifications, especially in the realm of financing. Considering the fact that the word financing is mentioned in this definition it might be appropriate to assume that respondents were influenced to score this service higher. However, based on the scale and how it compared to the mean value for this service suggests that within the financial auditing arena that the vast preponderance of total service is expended on labor.

For the characteristic of "risk to Government" the highest mean value came from security service. The mean value for this service and characteristic was significantly higher than the mean value for all services. The researcher felt that the terrorist's attacks on the United States on September 11, 2001 might have predisposed respondents to score this particular area higher than they might have otherwise. The scale definition (the likelihood and magnitude of potential harm to the Government due to service performance failure is substantial) where the mean value fell makes it easy to see that this was the appropriate ranking for this characteristic.

## **2. Lowest Mean Value**

The lowest mean values were somewhat evenly distributed amongst eight of the thirty services. However, the vending machine operations service accounted for four of the lowest mean values. Vending machine operations had the lowest mean value in each of the following characteristics: measurability, confidentiality, Government attention, and stability. The fact that this service had

the lowest mean values for these characteristics is indicative of the type of service being performed. There is little to measure, either a machine is full or it is not. There is little in the way of confidentiality as vending machines do not pose a threat to security and do not possess any technology that is not readily available around the world. Government attention is better spent on services that require a higher degree of oversight based relative importance. Stability is the degree to which important schedule and performance criteria of a service remain over a period of time and in the researcher's opinion is not applicable for vending machine operations.

Three other services had two characteristics in which they had the lowest mean values. They were, Custodial and Janitorial services, Laundry and dry-cleaning services and landscaping services.

Custodial and Janitorial services had the lowest mean values for "customization" and "complexity" and were well below the mean value for ten of the twelve characteristics. This was not considered a surprise and in fact, was somewhat expected due to the nature of the responsibilities of this service. Custodial and janitorial services are the same for Government activities as they are for private industry and do not require a great deal of customization. The area of complexity could have been scored low do to the subjective nature of the survey and the personal preconceived notions of the respondents. While some facets of these services may be complex or candidates for customization, by most accounts these are non-complex operations and were scored appropriately.

Laundry and dry-cleaning services had the lowest mean values for "expertise" and "perishability" and were significantly below the mean value for all twelve characteristics. This appears to be a function of the predisposition of respondents that this is an inherently easy task. The fact that perishability had an extremely low mean value was in fact a positive factor. The scale for perishability indicated that the period of benefit/consumption is immediate. Laundry tends to get dirty and requires frequent cleaning.

Landscaping services had the lowest mean values for "risk to Government" and "competition" and as a service was well below the mean value for all services in ten of the twelve characteristics. The definition for "risk to Government" is the likelihood and magnitude of potential harm to the Government that would result if a service were not completed in accordance with cost, schedule or performance specifications. Buyer attention should increase throughout the entire procurement process as the degree of risk to the Government escalates. It is the researcher's opinion that this is clearly not the case, with respect to landscaping and that any failure to perform would not significantly impact the Government. The case of competition could be one in which the scale may appear to be counter-intuitive. Because of the low mean value, it would appear that competition does not exist. However, in this situation there are many suppliers who are willing and able to compete and provide the necessary service.

### **3. Comparison of Service Groups**

The next step in analyzing the mean value matrix was to compare the mean values for the individual

characteristics in terms of groups of services. There were thirteen separate groups of logistics services as suggested by OMB Circular A-76 (Appendix B) that the researcher chose to consider. Of these thirteen groups, five consisted of a single service and the remaining eight contained multiple services. For the purpose of analysis, the researcher will discuss the eight multiple service groups in greater detail than the single service groups. In concert with the mean value matrix, the researcher is also employing the bar charts from Tables 5 through 12 in Chapter IV.

***a. Audiovisual Products and Services***

This grouping is comprised of the following services: audiovisual, photographic processing, and arts and graphics. Table 5 represents the mean value for each of the characteristics within this group of services. This grouping was very similar in that as a group they tended to be scored below the mean but close to 2.0 on the scale for each characteristic. Specifically, in nine of the twelve characteristics this group was below the mean values for all services.

***b. Information Technology Services***

As previously discussed in this chapter, this group consists of three services: IT facilities management, IT equipment, installation, operations and maintenance, and IT programming, design and analysis. This grouping was tightly bunched together and while IT programming, design and analysis had the highest mean value for nine of twelve characteristics, the other two services were never far behind. The mean values for the group were appreciably higher than the mean values for all services by characteristics as depicted in Table 6 of Chapter IV.



Without question, this group represents the highest mean values for all of the service groups. The obvious attraction to these types of information-based services is that the possibilities are endless with opportunities for improved efficiencies, improved capabilities and computer based business solutions.

***c. Food Services***

This grouping consists of only two services, food service and vending machine operations. In stark contrast to the IT services, this group had the lowest mean values across the board and as mentioned previously, vending machine operations accounted for four of the twelve lowest mean values. One of which, "confidentiality", had the lowest mean value for the entire survey. These factors can be attributed to the low level of technology involved with these types of services. It should be noted that food service mean values were higher for every characteristic when compared to vending machine operations. This can also be easily explained in that Food services entails a degree of complexity with multiple functions and tasks that vending machine operations does not. Table 7 in Chapter IV illustrates how basic these functions are by comparing the mean values to the scale.

***d. Health Services***

This grouping consists of two seemingly different services: Medical and Dental services and Occupational Safety and Health Administration (OSHA) functions. However, largely due to the high mean values for medical and dental, this group is the second highest with respect to mean values behind IT services. Medical and dental service had higher mean values for every characteristic and

also had two of the highest mean values for individual characteristics. The researcher expected this group to be higher than most primarily due to the immediate impact and high visibility of these services throughout the Federal Government. Table 8 in Chapter IV presents how the range of mean values for these services appeared across the characteristics.

***e. Industrial Shops and Services***

This group represented the largest number of services assigned to a single group with five and consisted of the following services: 1) Machine, carpentry and electrical, 2) Plumbing, heating and air conditioning, 3) Fire prevention and protection, 4) Custodial and janitorial, 5) Refuse collection and processing. In general, these services were all somewhat similar with the exception of fire prevention and protection, which seemed to be better aligned with security services based on mean value scores. Table 9 presents a very diverse range of mean values for the associated services, which is indicative of the three different groups within this particular group. The first being the two industrial shops, the second being the fire prevention and protection and the final group of custodial and janitorial with refuse collection and processing. Fire prevention and protection had a higher mean value in eight of the twelve characteristics and tended to bring the mean value up for the entire group. The industrial shops while not significantly higher with respect to mean values were higher than custodial and janitorial and refuse collection and processing for eight of the twelve characteristics.

***f. Office and Administrative Services***

This group consisted of four services, specifically, (1) word processing and data entry, (2) Financial auditing, (3) Material Management, and (4) Supply services. With the exception of word processing and data entry, the remaining services were very tightly grouped together. Despite the consistently low mean values for word processing, this group managed to achieve better than average scores as compared to the mean value for all services. Word processing and data entry had the lowest mean value range in eleven of the twelve characteristics. An interesting observation was that financial auditing, which is part of the Management Support services, fit almost perfectly into the Office and Administrative services when compared to mean values. This is due to the fact that it seems to be a more natural fit in this service group than the one currently assigned. Table 10 in Chapter IV presents a relatively high range of mean values despite the fact that one of the services tended to bring it down.

***g. Other Services***

Just as the group title implies, these services have very little in common and appear to be a catchall category. This group consists of (1) laundry and dry-cleaning, (2) Mapping and charting, and (3) training. As incongruent as this group appears, the actual mean values would have to be way off the mark. In fact, they are and while the groups average mean appears to be stable and consistent it is impacted by the extreme values of the different services within the group. It is important to note that laundry and dry-cleaning accounted for two of the lowest mean values in the entire matrix. The lower than

average mean values are a direct result of laundry and dry-cleaning. Seven of the twelve other services mean values were less than the mean value for all service by characteristic. Table 11 in Chapter IV presents how the range of mean values for these services appeared across the characteristics.

#### ***h. Transportation Services***

This group consisted of (1) bus and shuttle, (2) motor pool operations and (3) vehicle operations and maintenance services and each of them were very similar. The mean values for this group tended to be below the mean value for all services. The bus and shuttle service contributed to the reduced mean value scores, as this is obviously the most non-complex function of the three services listed in the transportation group. In addition, bus and shuttle services scored the lowest mean value for all services for the characteristic of "measurability". Table 12 presents how the range of mean values for these services appeared across the characteristics.

#### **C. ANALYSIS OF SERVICE CLASSIFICATIONS**

The researcher felt that an analysis of each of the thirty services from the individual service classifications (Appendix D) would help to support findings from the mean value matrix analysis. While each individual service classification was analyzed, they were grouped together by services, including service groups that only contained a single service. This portion of the analysis focused on the progression of each of the service classifications with respect to the category titles that were discussed in Chapter IV and how they compared to other services within a given group. Each classification, by virtue of a mean

value, fell into one of the following categories: (1) Non-complex, (2) Basic, (3) Intermediate, (4) Advanced and (5) Complex. Furthermore, within each category, the mean value is further categorized by a boundary range and is represented by a "+", "0" or "-". Table 3 in Chapter IV provides an example of a service classification. Tables 20 through 32 present the 13 Service groups and the service(s) within that group. Associated with each service is the category that each was assigned based on the mean values for each of the 12 characteristics for that particular service.

#### 1. Audiovisual Products and Services

This group consisted of the following services: Audiovisual, Photographic Processing and Arts and Graphics. Based on personal experience, the researcher expected that these services would be categorized as **basic** and in fact, they were. However, there were some noticeable differences within this group. Audiovisual service characteristics ranged from **non-complex** to **intermediate** with more than half of them falling in the basic category (seven out of 12). Photographic processing ranged from **non-complex** to **basic** with the majority of the characteristics falling in the **basic** category. Of interest was the fact that this service represented the only occasion in all thirty services where the characteristic of "labor as a percentage of cost" was categorized as anything less than **intermediate (basic)**. Arts and graphics ranged from **basic** to **intermediate** with all but two of the characteristics categorized as **basic**. The mean values primarily fell in the middle one third of a given category range, suggesting that they were classified in the correct category. These three services were not an

exact fit as the range of categories varied, but for the most part each of the three services fell in the **basic** category as were expected.

	Audiovisual Products and Services	
	Service	Category
1	Audiovisual	Basic
2	Photographic processing	Basic
3	Arts and graphics	Basic

Table 20. Services Group 1.

Table 20 presents the services of Audiovisual Products and Services and shows that each of the services of this group is in the **basic** category. These services are quickly becoming archaic and the researcher surmised that due to the subjective nature of the survey this could have affected how these services and the associated characteristics were ranked. However, as more and more technological advances are made with digital imaging and compact discs the researcher expects that the landscape of these services could change.

## 2. Information Technology Services

This group consisted of the following services: (1) IT - equipment, installation, operations and maintenance, (2) IT - facilities management and (3) IT programming, design & analysis. The researcher expected this group to be at the upper end of the complexity scale based on both personal experience and previous analysis. The three services had the same range of categories, from **basic** to **advanced**. Facilities management and equipment, installation, operations and maintenance had the same category breakdowns with each having characteristics falling in the **basic**

(one), **intermediate** (seven) and **advanced** (four) ranges. The difference between the two was that more (five of seven) of the mean values for facilities management in the intermediate category fell in the middle to lower one-thirds just as more of (three of four) the mean values in the **advanced** category fell in the lower one-third of that category range. Suggesting that facilities management should be in the **intermediate** category. Conversely, the equipment, installation, operations and maintenance services had the majority (five of seven) fall in the upper or middle one-third of the **intermediate** range, indicating that this service could be categorized in an **intermediate** to **advanced** category range.

While the final service of IT programming, design and analysis had the same range of categories as the other two services in the group it was clear that this service was in a class by itself. This service was the only service that was classified as **advanced** out of all thirty services. Many services had one or two individual characteristic mean values that fell in the **advanced** category, however, this service had ten of twelve in this category and most (seven of 10) fell in the middle to upper one-third of that category range. An interesting fact was that for each service of this group, the mean value for competition fell in the basic category, which by the definition and scale was appropriate.

Table 21 presents where each of the services of IT Services was categorized according to mean value scores for the characteristics. With the impact of computers on not only DOD but also the entire World it is self-explanatory

why these services were rated so highly. Once again, the subjective nature of the survey has to be taken into account. The researcher believes that this played a role especially in the case of facilities management. The researcher did not expect facilities management to have such high mean values for each characteristic but with the Information technology association it would appear that respondents were ranking IT and not facilities management.

Information Technology Services		
	Service	Category
1	IT Facilities Management	Intermediate
2	IT Equipment, Installation, Operations & Maintenance	Intermediate
3	IT Programming, Design & Analysis	Advanced

Table 21. Services Group 2.

### 3. Food Services

This group consisted of food services and vending machine operations. These two services appear to be very dissimilar in that they both fit into distinctly different categories. The researcher fully expected that vending machine operations would fall in the non-complex category and it did. The category ranges went from **non-complex** to intermediate. This appears to be simply a function of the type of work required which is very straightforward. The researcher also expected that food services would fall in the **basic** category and it did. Food services category ranges were from **non-complex** to **advanced**. However, upon closer inspection, a case could be made that these two services are not so different. Seven of nine vending machine operations characteristics that fell in the **non-**



**complex** category was in the upper (three of seven) and middle (four of seven) one-third of the category range. Conversely, six of the eight mean values for food services fell in the **basic** category and the majority fell in the lower (five of seven) and middle (two of seven) one-thirds of the category range.

Food Services		
	Service	Category
1	Food Services	Basic
2	Vending Machine Operations	Non-complex

Table 22. Services Group 3.

Table 22 presents the Food Services group, which intuitively would suggest **basic** and routine services. Especially in light of the fact that these are not five star restaurants but rather enlisted dining facilities. The requirement is to provide a hot, nutritious meal to literally thousands of people. As such, food services would not require customization, expertise or even confidentiality. Due to the fact that services are primarily labor driven, the researcher did expect the "labor as a percentage of cost" to be high and of course, it was. Vending machine operations require very little administrative action and fit into the **non-complex** category very well. The researcher was surprised to see that "labor as a percentage of cost" was categorized as **advanced** for the simple reason that a very small amount of total service cost is expended on labor. Vending machine costs are heavily weighted to the hardware and product (goods) costs.

#### 4. Health Services

This group consisted of medical and dental services as well as Occupational Safety and Health Administration (OSHA) services. Ranges for medical and dental services went from **basic** to **advanced** whereas the ranges for OSHA went from **non-complex** to **intermediate**. The researcher did not believe that these two services fit together as a group due to the nature of the functions and where the mean values fell within the classification supported this. While not a significant difference, the two services were in separate categories. The mean values for OSHA fell in the **basic** category in six of the twelve characteristics with half of those in the lower one-third of the category range. Of those that were in the **intermediate** category (4 of 5), three of the five were in the lower one-third category range. The researcher interpreted this to mean that OSHA services should be categorized as **basic**. Medical and dental services clearly fell in the **intermediate** category as six of seven of the characteristics that fell in this category were in the upper (two of six) and middle (four of six) one-third of the category range.

Health Services		
	Service	Category
1	Medical and Dental	Intermediate
2	OSHA	Basic

Table 23. Services Group 4.

Table 23 presents the Health Services group with the two services each in a different category. The researcher expected Medical and Dental services to be in the

intermediate group as professional services usually require a great deal of expertise. This service was no exception and in fact, had the single highest mean value for any characteristic in the entire survey. The researcher felt that OSHA mean values could have been affected because of subjectivity and potential preconceptions regarding the role OSHA plays in the Federal Government.

#### **5. Industrial Shops and Services**

This group consisted of the following services: (1) Machine, carpentry, and electrical, (2) Plumbing, air conditioning and heating, (3) Fire prevention and protection, (4) Custodial and janitorial, (5) Refuse collection and processing. This group was the largest and appeared to have three separate groups within. The first two services were the industrial shops and they ranged from **non-complex** to **basic** and with respect to where the mean values fell within a category, were almost mirror images of each other. They fit securely in the **basic** category. The next service, fire prevention and protection, ranged from **non-complex** to **advanced** and while the mean values fell in primarily the **basic** and **intermediate** categories there was no real hard evidence suggesting that it fit in either category well. It could have gone in either category but because of the service group the researcher classified it as **basic**. The remaining two services, custodial and janitorial and refuse collection and processing, were also very similar. Custodial and janitorial services ranged from **non-complex** to **advanced** and refuse collection and processing services ranged from **non-complex** to **intermediate**. The majority of mean values for both of these services fell in the **non-complex** range (six of 12 for

both) but the mean values for the other characteristics were high enough to support categorizing these services as **basic**. The bottom line is that while there were some differences within the individual services of this group, they all fell in the **basic** category.

Industrial Shops and Services		
	Service	Category
1	Machine, Carpentry & Electrical	Basic
2	Plumbing, AC & Heating	Basic
3	Fire Prevention/Protection	Basic
4	Custodial & Janitorial	Basic
5	Refuse Collection & Processing	Non-complex

Table 24. Services Group 5.

Table 24 presents the Industrial Shops and Services group, which are made up of trades and blue-collar type work. For each of the individual services, "labor as a percentage of cost" had a very high mean value and was categorized at or above the intermediate level. This is due to the fact that these types of services are predominantly dependent on labor. Therefore, labor rates and labor hours are a significant element to be considered when procuring these types of services.

## 6. Management Support Services

Financial and payroll services was the only service chosen from this group as it was the only one out of the OMB Circular A-76 listing that the researcher deemed pertinent to this research. The category range was from **basic** to **advanced**. Seven of the twelve characteristic mean values fell in the **intermediate** category, however, five of the seven were in the lower one-third suggesting that this

service could easily be in the **basic** or **intermediate** category. The researcher makes this observation only to support that this service might have been a better fit in the next group of services, Office and Administrative Services, based on the similarities of ranges and where the values fell.

Management Support Services		
	Service	Category
1	Financial & Payroll	Intermediate

Table 25. Services Group 6.

Table 25 presents a single service that was selected from the Management Support Services group. This service plays a critical role in ensuring employees are paid but more importantly for the pricing structure that the service company employs. The characteristics "labor as a percentage of cost" and "expertise" are important factors for this service due to labor hour and labor rate calculations as well as the degree of knowledge necessary for managing budgets and funds.

## 7. Office and Administrative Services

This group consisted of the following services: (1) Word processing and data entry, (2) Financial auditing, (3) Material management and (4) Supply. The researcher initially thought that word processing and data entry were correctly grouped but the classification scheme suggests not or at the very least it is not at the same end of the spectrum. The category ranges varied from **non-complex** to **advanced** with the majority (seven of 12) of mean values falling in the **basic** category. Of the seven mean values in the **basic** category, five of them were in the lower one-

third of the category range. That might suggest that the proper category should be non-complex but three of the four mean values in the non-complex category were in the upper one-third of the category range. The researcher felt that this justified leaving this service in the basic category although at the lower end. The remaining three services all fit somewhere in between the basic to intermediate categories. Financial and payroll services were very similar to material management and supply services but fit even better with the previously mentioned financial accounting. The category range for financial and payroll services was from basic to **advanced** with the vast majority of mean values falling in the **intermediate** category. However, just as was the case with financial auditing, the mean values that fell in the **intermediate** category range were primarily in the lower one-third (five of seven). This suggests that this service could fit into either category of **basic** or **intermediate**. The next two services, material management and supply were very similar in many respects. First, they both had categories ranges from **basic** to **intermediate**. Second, each had mean values in the **basic** category that were in the upper one-third of the category range. Material management had six of seven mean values that were in the upper one-third and supply had four of six in the upper one-third basic category range. Once again, this suggests that these services could fit into either **basic** or **intermediate**. All five of the services in this group could be placed in the **basic** category and with the exception of word processing and data collection could just as easily be placed in the **intermediate** category.

Office and Administrative Services		
	Service	Category
1	Word Processing & Data Entry	Basic
2	Financial Auditing	Intermediate
3	Material Management	Basic
4	Supply	Basic

Table 26. Services Group 7.

Table 26 presents Office and Administrative Services and as the name suggests, these services are classified as administrative in nature. However, as they are services there is still a large amount of manual labor involved and that serves to drive labor hours up. As the researcher expected, with labor being the largest category of cost, the characteristic of "labor as a percentage of cost" would consistently have the highest mean value across these services.

#### 8. Other Services

This group consisted of three distinctly different services and they were, laundry and dry-cleaning, mapping and charting, and training. In every respect these services came out differently. They differed on category ranges as well as the category that they ultimately ended up in. Laundry and dry-cleaning ranged from **non-complex** to **intermediate** and the mean values fell in the **non-complex** category for eight of the twelve characteristics. Of the four remaining characteristic mean values, three were in the **basic** category and were all in the lower one-third of that category range. The researcher expected that mapping and charting services would be somewhere in the **intermediate** range based on the perceived complexities

involved with these processes. However, the data suggest that mapping and charting services are definitely **basic** in nature. The category range was from **basic** to **intermediate** but nine of the twelve mean values were in the **basic** category and of the remaining three in the **intermediate** category, two of the three were in the lower one-third of the range category. The remaining service, training, was without a doubt in the researcher's mind in the **intermediate** category. The category range was from **basic** to **advanced** with seven of the twelve characteristic mean values in the **intermediate** range. Only two of mean values that fell in the **intermediate** range were in the lower one-third of that category range. Conversely, of the four mean values in the **basic** category, three of them were in the upper one-third of the category range. For the three services in the Other Services group they were each different and that was not only outwardly evident but also evidenced by the differences in which category they fell.

Other Services		
	Service	Category
1	Laundry & Dry-cleaning	Non-complex
2	Mapping & Charting	Basic
3	Training	Intermediate

Table 27. Services Group 8.

Table 27 presents Other Services, which is the most diverse group of services and as such is difficult to characterize as types of professions. The only common link between these three was the characteristic of "labor as a percentage of cost". Once again this is not surprising, as all three require that a large degree of the service is



dependent on labor. This implies that more of a focus should be directed towards labor hours and labor rates. Another factor for this group of services that needs to be taken into account is the subjective nature of these services. Respondents could have harbored predisposed opinions regarding one or all of these services thereby affecting the mean values.

#### 9. Communications System

Base communications was the only service in this group. This service could easily be classified as **basic** or **intermediate** as the mean values were almost evenly distributed between the two. The category range was from **basic** to **advanced** with half of the mean values falling in the **intermediate** category and five of the remaining six falling in the **basic** category. All of the values that fell in the **basic** category were in the middle or upper one-third of the category range. Whereas, four of the six values in the **intermediate** category were in the lower one-third of the category range.

Communications Systems		
	Service	Category
1	Base Communications	Intermediate

Table 28. Services Group 9.

Table 28 presents another group of services in which only one service was selected. Based on the characteristic mean values this service should be in the **intermediate** category. Of note, "risk to Government" had the highest mean value for the 12 characteristics in this group. Based on the fact that the Federal Government is dependent on the

ability to communicate in order to accomplish the day-to-day business of defending our country, this makes sense.

#### 10. Printing and Reproduction

Printing, copying and duplication make up the only service of this group. This service ranged in categories from **non-complex** to **intermediate** with nine of the twelve mean values falling in the **basic** category. The researcher expected this service to be in the **basic** category due to the nature of the services provided.

Printing and Reproduction Services		
	Service	Category
1	Printing, Copying & Duplication	Basic

Table 29. Services Group 10.

Table 29 presents the service of printing, copying and duplication, which is the only one in this particular group. This service was tightly aligned to the **basic** category due in large part to the very nature of the function being provided. The only outliers for this service were the following characteristics, "labor as a percentage of cost", "customization" and "competition". "Labor as a percentage of cost" can be explained by the fact that this service requires a high degree of manual labor and is the most important element in this service. The other two characteristics both fell in the non-complex category. "Customization" is easy to reason why because of the clear-cut function of the service. For "competition", the researcher has made the assumption that a large number of providers are willing and able to provide this type of

service and that reduces the importance of competition in general.

### 11. Landscaping Services

Landscaping is the only service in this group. While the category range went from **non-complex** to **intermediate**, half of the mean values fell in the **non-complex** category. There were four mean values in the **basic** category but three of them were in the lower one-third of the category range. The researcher expected these results for this service based on personal experience and the nature of the services provided.

Landscaping Services		
	Service	Category
1	Landscaping	Basic

Table 30. Services Group 11.

Table 30 presents the services group of Landscaping Services, which only includes the service of landscaping. This service is primarily one of manual labor and as expected, the characteristic "labor as a percentage of cost" had the highest mean value for this service. This service, like many others, is impacted by Department of Labor wage rate determinations and can affect labor hours but more importantly, labor wages that could present problems throughout the life of the contract.

### 12. Security

Once again, this was the only service in this group. The category range went from **basic** to **advanced** and was somewhat evenly spread amongst the three categories. Five of the mean values fell in the **intermediate** category but of

the five, three were in the lower one-third of the category range. Four of the mean values fell in the **basic** category and three in the **advanced** category. This service could fit in either the basic or intermediate category. The researcher observed that the services of security and fire prevention and protection were very similar in both scope of work as well as were the mean values fell for the stated characteristics.

Security Services		
	Service	Category
1	Security	Intermediate

Table 31. Services Group 12.

Table 31 presents Security Services, which as an individual service had characteristics that fell in a wide range across the categories. As a service it would have to be categorized as **intermediate** due to the fact that the majority of characteristics mean values were consistently high. "Labor as a percentage of cost" was considered of significant importance, as were "confidentiality" and "risk to Government". Security Services entails a greater need for the characteristic "confidentiality" than the normal logistics services due to the unique nature of DoD. Security encompasses a large area of responsibility in ensuring national security and requires a high degree of "confidentiality" especially when contracting for security services. "Risk to Government" goes hand in hand with confidentiality and it was not surprising to note that these two characteristics were categorized as **advanced** with "labor as a percentage of cost".

### 13. Transportation Services

This group of services consisted of the following services: (1) Bus and shuttle, (2) Motor pool operations and (3) Vehicle operations and maintenance. This group of services was very similar with some very slight differences. They all shared the same category range from non-complex to intermediate and the mean values tended to cluster in either non-complex or basic. As a rule, this group tended to fall in the basic category. The researcher expected there to be a high degree of similarity for this group, as they did not appear to differ very much in scope of work. Obviously, a bus and shuttle service is different from motor pool operations but the bottom line is that they all deal with vehicles and they fit cleaning in the group of transportation. Half of the mean values for bus and shuttle services fell in the non-complex category and were all in the middle (three of six) to upper (three of six) one-third of the category range. Five of the remaining six characteristic mean values fell in the basic category with three of those being in the middle one-third of the category range. As expected, motor pool operations were just a little more involved than bus and shuttle services. Nine of the twelve characteristic mean values fell in the basic category however; five of those were in the lower one-third of the category range. There were two mean values in the non-complex category but both were in the upper one-third of the category range. Vehicle operations and maintenance was very similar to motor pool operations. As was the case with motor pool operations, this service also had nine of twelve characteristic mean values in the basic category, but in this case, six of the nine were in the middle to upper one-third of the category range. As a

whole, this group tended to be in the **basic** category but in varying degrees according to each service.

Transportation Services		
	Service	Category
1	Bus & Shuttle	Basic
2	Motor Pool Operations	Basic
3	Vehicle Operations & Maintenance	Basic

Table 32. Services Group 13.

Table 32 presents the services of Transportation Services and shows that each of the services of this group is in the **basic** category. The common trait that these services share is "labor as a percentage of cost". Obviously, these types of services are dependent primarily on labor. Labor hours and labor rates will dictate how this type of service contract is procured. While this is the predominant element in a service contract of this type, there were many other characteristics that appeared to be of significant value, such as, "expertise", "risk to Government", and "Government attention".

#### D. ANALYSIS OF STRATEGIC PRIORITY RANKINGS

The third and final area that the researcher chose to analyze was that of strategic priorities. The strategic priorities were developed from the rankings submitted by survey respondents. In order to assist the analysis, the researcher utilized Tables 14 through 19 in Chapter IV, which broke out the strategic priorities in a variety of ways. Table 14 is a listing of the strategic priorities ranked in order of frequency count. Tables 15, 16 and 17 are the frequency counts for the #1, #2 and #3 rated strategic priority respectively. Table 18 is a weighted

scoring for each characteristic and Table 19 is a cumulative chart showing each characteristic and its frequency count or score. These charts were useful in that they enabled the researcher to determine natural breaks within the characteristics as well as to determine trends of the characteristics and where they fell out in relation to each other. After a brief discussion of each of these Tables, the researcher will attempt to bring them all together and make observations based on looking at all of the Tables as opposed to just looking at them as individual pieces of information.

### **1. Analysis of Top Three Strategic Priority Rankings**

The top three strategic priority rankings were done in descending order and ranged from 412 points to 60 points. The points were simply the total of the number of times that a characteristic was voted as the first, second or third in order of strategic importance by survey respondents. This first chart was separated into four groups by establishing natural breaks in the data. In what quickly became a trend, the first two characteristics listed were "Labor as a percentage of cost", with 412 points and "expertise" with 357 points. The researcher had expected that "labor as a percentage of cost" would be a top strategic priority based on the fact that Government resources are shrinking and that DOD in general is trying to identify creative ways to fund all of the many requirements it has. PBSA is a way to help reduce costs and still meet Government requirements. The researcher deemed the second grouping of characteristics as a natural break. "Competition" with 293 points, "customization" with 267 points, and "measurability" with 233 points. The next

break was determined to be at the characteristic for "complexity", which had 192 points, followed by "perishability", "Government attention", "stability" and "risk to Government" with 147, 137, 128 and 122 points respectively. The final group also quickly became a trend with "confidentiality" and "negotiation" rounding out the bottom with 82 and 60 points respectively.

The characteristic "labor as a percentage of cost" is and should be the predominant element in the process of contracting for services. While labor hours are important, it is the labor rates that can and will affect prices. Many factors contribute to this, such as Department of Labor wage rate determinations labor classifications depending on specific regions or even service. The characteristic "expertise" was also highly ranked throughout this process and that is a function of individual services and the type of services provided. Professional, administrative and trade services can all require a high degree of expertise in order to effectively provide a service.

At the other end of the spectrum, the characteristics for "negotiation" and "confidentiality" consistently scored very low. This is due to the fact that services are primarily contracted using the sealed bidding method which requires no negotiations. The need for confidentiality is limited to technical areas such as IT and security. Inherently, there is not a great need for secrecy when doing landscaping or custodial work.



## **2. Analysis of Frequency Rankings**

The next set of data analyzed was the Tables that depicted charts of the characteristic order based on frequency that a strategic priority was cited first, second or third.

Table 15 presents characteristics in order of frequency count that were ranked #1 as a strategic priority. These characteristics were assigned points for each occasion that they were ranked as a #1, #2, or #3. These points were summed together to form an unweighted total. The researcher has broken this chart into three groupings in order to better differentiate the data. The first grouping was once again, "labor as a percentage of cost" with 215 points and "expertise" with 150 points, which was to be expected based on the previous total frequency count. The next group started out in much the same way that the total frequency count did as expected with "competition" with 95 points, and "customization" with 83 points. Rounding out this second group was "complexity" with 73 points and "perishability" with 65 points. The last group contained the following characteristics and their respective points: "risk to Government"; 37, "stability"; 25, "measurability"; 18, "Government attention"; 17, "confidentiality"; 17, and "negotiation", 15. The major change was that "measurability" dropped significantly which appears to be the result of "labor as a percentage of cost" and "expertise" accounting for 45 percent of the total points and that "measurability" is extremely high for the #2 and #3 strategic priority rankings. Once again, "confidentiality" and "negotiation" were ranked last.

As previously discussed, "labor as a percentage of cost" and "expertise" were the top two characteristics. Services are inherently labor oriented and thus dictate that special attention should be paid to this characteristic. "Expertise" can be related to how different services are classified, i.e., labor classifications around specific services. Health care professionals, information technology experts and even laborers with specific skills in trades require a requisite amount of knowledge that is deemed essential in providing the services required by the Federal Government.

"Negotiations" and "confidentiality" and why they consistently rank last has been addressed and does not require further discussion.

Table 16 presents characteristics in order of frequency count that they were ranked #2 as a strategic priority. This set of characteristic rankings was also broken into three groups based on where there were breaks in the numbers. The first group was essentially the same with the top two characteristics switching places. "Expertise" with 125 points and "labor as a percentage of cost" with 120 was first and second respectively. The next group consisted of "measurability" with 103 points, "competition" with 95 points, "complexity" with 86 points and "Government attention" with 75 points. The final group of characteristics that were ranked as the #2 strategic priority were "stability" with 46 points, "risk to Government" with 39 points, "confidentiality" with 36 points, "perishability" with 32 points, "customization" with 27 points and "negotiation" with 26 points. This was

the only case where "confidentiality" did not finish next to last with "negotiation".

Table 17 presents characteristics in order of frequency count that they were ranked #3 as a strategic priority. This set of rankings differed from the previous two because the researcher chose to break the characteristics into four groupings vice three. This was done due to the fact that there were not as clear-cut natural breaks between the groups. For the first time, "labor as a percentage of cost" and "expertise" were not at the top of the list. This make sense because many respondents had ranked them #1 or #2 previously so there were not that many left to go around. However, they were both still in the top five indicating the respective importance of both in the eyes of the respondents. The first grouping consisted of "customization" with 157 points, "measurability" with 112 points and "competition" with 103 points. These three characteristics while not in the top two until this point seem to be in the top five. The next group consisted of "expertise" with 82 points and "labor as a percentage of cost" with 77 points. The third group starts with "stability" with 57 points, "perishability" with 50 points, "risk to Government" with 46 points and ends up with "Government attention" with 45 points. These characteristics consistently tends to be toward the middle to lower part of the pack possibly indicating that their relative importance is dependent on a given situation. The fourth and final group consisted of "complexity" with 33 points, and "confidentiality" with 29 points and last again, "negotiation" with 19 points. "Complexity" being at the bottom appears to be an anomaly

as it had consistently been in the upper levels of the rankings. The fact that "confidentiality" and "negotiation" were always at the bottom of the rankings may be related to how logistics services are perceived and how they relate to PBSA.

Worth noting is the fact that for the first time "labor as a percentage of cost" and "expertise" were neither one nor two. This is simply based on the fact that most respondents ranked these two characteristics as either the first or second place. It only made sense that another characteristic would be cited as the number three characteristic ahead of "labor as a percentage of cost" and "expertise".

In order to tie the frequency count and the strategic priority rankings all together the researcher felt that a weighted value ranking would help to increase the visibility of those characteristics that received recognition by the respondents, but not enough to be considered an overall #1 ranking. This would ensure a more equitable distribution for all the characteristics and the priority rankings. As discussed in Chapter IV, the weighted averages assigned for each first, second or third ranking were "5", "3" and "1" respectively. Table 18 presents the characteristics in order of rank by their weighted scores. For this chart the researcher broke the characteristics into four groups, which enabled a better comparison against the frequency count of the top three strategic priorities as depicted in Table 14 of Chapter IV and discussed previously in this chapter. The first group was of course, "labor as a percentage of cost" with a

score of 1512 and "expertise" with a score of 1207. This group tracked with the unweighted scores of Table 14. The next group was "competition" with 863 points, "complexity" with 656 points and "customization" with 653 points. The only difference from the unweighted rankings for this group was that "complexity" and "measurability" switched groups. This was not surprising due to the fact that "measurability" received a large portion of points when it was cited as the #3 strategic priority and "complexity" scored a higher proportion on the #1 strategic priority. Base on the assigned point values for the weighted scores, "complexity" would have to be ahead. The next group consisted of "measurability" with 511 points, "perishability" with 471 points, "Government attention" with 355 points, "risk to Government" "stability" with 348 points and "stability" with 320 points. With the exception of the switch noted above this group was basically the same as that of the unweighted scores. Last but not least, the final group consisting of "confidentiality" with 222 points and "negotiation" with 172 points. There were only a couple cases where the characteristics score ranking were different for the weighted and unweighted score and they could be explained by the relative ranking position as a #1, #2 or #3.

The last chart that the researcher compiled was Table 19 in Chapter IV and it represented a combined frequency chart with the scores for each of the times a characteristic was cited as #1, #2 or #3, the unweighted total and the weighted total. This allowed the researcher to determine the top three and the bottom three characteristics according to the respondent's inputs and

the researchers' data analysis. The top three were not a surprise and they were: (1) "labor as a percentage of cost", (2) "expertise", and "competition". "Labor as a percentage of cost" was easy to determine, as it was the #1 ranked characteristic in three of the five charts, second in another and fifth on the remaining chart. The second highest strategic priority was "expertise" and was just as easy to determine as it was the second ranked characteristic in three of the five charts, first in another and fifth on the remaining chart. Fortunately, the third highest strategic priority was just as simple. It ranked third in four of the five charts and fourth in the remaining chart. After the top three strategic priorities there was a significant drop in points and not a lot of distinction between the characteristics. However, by ranking the remaining characteristics by the weighted scores the researcher was able to generate a list of the top strategic priorities. This information is presented in Table 19 of Chapter IV. The researcher felt that an important aspect of this chart was to determine the bottom three characteristics according to strategic priority. Just as with the top three, the bottom three was very easy to determine and not just by using the weighted scores. The bottom three in order of strategic priority was "negotiation", "confidentiality" and "stability". "Negotiation" was the last characteristic in all five of the charts. "Confidentiality" was next to last in four of the five charts. "Stability" was ranked tenth in the weighted score but received the distinction of being ranked in this dubious category primarily by virtue of the number of times cited as a #1 ranked strategic priority.

## **E. SUMMARY**

This chapter has detailed the results of the researcher's efforts to analyze the data collected and to determine if by utilizing the classification scheme developed by Allen, this research effort could develop a classification scheme for logistics services that incorporates the principles of PBSA management into the procurement process. By accomplishing this, it is hoped that the acquisition workforce could more easily identify adverse performance trends, incorporate metrics that are predictive in nature and allow for overall better management of PBSA contracts. A classification scheme for logistics services is intended to assist in properly grouping together like services to assist in identifying potential candidates for PBSA. Additionally, by comparing the salient characteristics and grouping like services in a strategic manner it will help to enable trend analysis, correct deficiencies, improve performance and ultimately enable the Department of Defense to realize a return on investment for PBSA contracts.

The next chapter will highlight the resultant conclusions of this research effort and provide recommendations for further research efforts.

## **VI. CONCLUSIONS AND RECOMMENDATIONS**

### **A. INTRODUCTION**

This purpose of this chapter is to present conclusions and recommendations based on the research effort. The primary and subsidiary research questions will be addressed and the chapter will conclude with recommendations for areas of further research.

### **B. CONCLUSIONS**

Several conclusions can be drawn from the research conducted in this study.

#### **1. Validation of the Allen Model**

The researcher concluded that the Allen model was appropriately constructed to accurately classify logistics services. In addition, it accurately reflected the key characteristics in categories that should be considered when contracting for logistics services. It further illustrated that it is indeed possible to classify logistics services by characteristics.

#### **2. Most Important Characteristics**

The characteristics, "labor as a percentage of cost" and "expertise", should be considered the most critical whenever constructing performance work statements, evaluation schemes and contract administration efforts. These characteristics were consistently rated as the most important and should always be considered when developing and executing contracts for logistics services.

#### **3. Least Important Characteristics**

It should be noted that none of these characteristics can or should be totally ignored during the procurement process and that all add some value. However, the



characteristics, "negotiation" and "confidentiality" appear to be the least important in the classification of logistics services. Therefore, the amount of attention given to the consideration of these characteristics should be addressed accordingly.

#### **4. Subjective Nature of Characterizing Services**

Any classification scheme that categorizes services will require subjectivity on both the researcher and survey population. The selection of the types of services and what each of those services may mean to individual respondents requires one to draw on personal experiences and potential bias that could affect the outcome. The twelve characteristics developed for this research also required a degree of subjectivity despite the fact that the definitions and scales were provided for each. The researcher utilized a scoring matrix that attempted to mitigate the subjective nature but understood that a degree of subjectivity was unavoidable. The researcher relied on the respondents' high degree of knowledge and experience within the procurement field to ensure reliable data were provided.

#### **5. The Right Mix of Characteristics**

The research effort conducted by Allen involved reducing the total number of characteristics (from 12 to eight) that the classification scheme would use to categorize services. The researcher concurs that eliminating some of the characteristics would have been of value. The researcher concluded that not all of the characteristics contributed to the same degree in the classification of logistics services. Based solely on where the natural breaks occurred in the strategic priority

rankings, the researcher could have eliminated four to six of the characteristics. The researcher determined that the following characteristics were of the most significant value in classifying logistics services: (1) "Labor as a percentage of cost", (2) "Expertise", (3) "Competition", (4) "Complexity", (5) "Customization", (6) "Measurability", and (6) "Parishability".

#### **6. Logistics Services are Basic to Intermediate**

The categorical titles assigned to the classification system utilized the following: **Non-complex, Basic, Intermediate, Advanced** and **Complex**. The researcher determined through the research effort that the majority of logistics services fell into the **basic** and **intermediate** categories. This makes intuitive sense as many of the services that constitute logistics services inherently seem to be **basic** or **intermediate** in nature. While there are logistics services that fall in other categories (IT, Vending Machine Operations) the vast majority in this research fell into one of those two categories. There were very few services that had mean values that were in the **complex** category, indicating that services are not complex.

#### **C. RECOMMENDATIONS**

As a result of this research effort, the researcher developed the following recommendations.

##### **1. Further Development of Classification Model**

The increased emphasis on PBSA and the amount of dollars spent on services annually, dictates that more attention should be directed at developing a classification system specifically for services. Goods are the primary focus of Government classification systems such as, FSC, SIC and the newly implemented NAICS. Currently, these

appear to be the only Government classification systems. However, as more emphasis is placed on how the Federal Government procures its services, there is a definite need for a services classification system. A classification system for logistics services would be of significant value to all acquisition professionals.

## **2. Evaluate the Model with Different Populations**

The model should not be limited to just the broad area of services. It should extend to many different groups of services in order to facilitate comparisons of individual services and groups of services against information collected in this research effort as well as that of others. Services are comprised of a large number of activities and they could be evaluated to gain insight into where to concentrate efforts for additional classification schemes.

## **3. The Role of the Top Characteristics**

Contracting activities should incorporate the knowledge gained from this research of the most and least important characteristics into the procurement functions. The characteristics, "labor as a percentage of cost" and "expertise" should be flagged in such a way that a significant amount of attention is placed on the role they have in the procurement process. Whenever procurements for logistics services are being constructed serious consideration should be given to these characteristics.

#### **4. The Role of the Least Important Characteristics**

In much the same way as with the most important characteristics, the least important characteristics are worthy of some attention as well. The knowledge gained from this research will allow acquisition professionals to streamline the procurement process through a process of elimination. All of the characteristics are important in their own right however, the data in this research have shown that "negotiation" and "confidentiality" are the least important characteristics in strategic priority for logistics services. Armed with this knowledge, contracting personnel should give serious consideration to using these characteristics when constructing performance work statements, evaluation criteria and contract administration plans in support of procurements for logistics services.

#### **5. Further Evaluation of the Allen Model**

Future research efforts should examine the Allen model and use it for evaluating services. Additionally, it should be continuously validated. The characteristics by which services are classified should also be researched and evaluated. Of significant value would be to create and evaluate different characteristics that might impact the way the Federal Government procures logistics services.

#### **D. RESEARCH QUESTIONS**

This section provides summary answers to the research questions from Chapter I. The primary research question that this thesis attempted to answer was:

- What would be the essential features of a taxonomical structure that would classify logistics services as procured by the Federal Government and how could this classification be incorporated into PBSA?

The essential features of the proposed taxonomical structure were inherent in the model developed by Allen. By evaluating that model the researcher was able to validate the classification system and apply it to logistics services. The key step was to establish the basis on which the scheme was developed. The next feature was the explanation of characteristics and associated scales. The data collection process enabled the researcher to develop meaningful data that allowed for an analysis and led to a classification scheme specifically for logistics services. Acquisition professionals charged with the responsibility of administering PBSA contracts can benefit from this research by understanding how logistics services are classified and what characteristics are the most strategically important.

The following are the subsidiary research questions:

- What is the background and history of Performance Based Services Acquisition?

As discussed in Chapter II, PBSA is not new and in fact has been around for quite a long time. It is however, receiving a lot of attention in the acquisition world as a new tool in the acquisition toolbox that will enable the Department of Defense to achieve the following objectives: (1) Maximize performance, (2) Maximize competition and innovation, (3) Encourage and promote the use of commercial services, (4) Shift risk from Government to Industry and (5) Achieve savings. Chapter II is dedicated to the background and history of PBSA.

- What is an appropriate classification scheme for logistics services as related to Performance Based Services Acquisition?

The appropriate classification scheme for logistics services is the model used in this research effort. The model sufficiently classified the selected logistics services by where they fell in groupings related to strategic priority rankings and category titles.

- What are the challenges facing performance Based Services Acquisition and what does the future hold?

It is important to understand the recent emphasis on PBSA. As mentioned, the Federal Government spends over \$200 billion and half of that is on services. Downsizing has impacted the way services are procured and has resulted in outsourcing to stem the tide. Reductions in requirements that are resource constrained can mean less oversight for the Government (Insight vs. Oversight). In addition, there have been significant savings, increased competition and improved innovation resulting from PBSA initiatives. As the Department of Defense moves forward in this era of acquisition reform and the Revolution in Military and Business Affairs, PBSA will continue to be a major factor in the way that the Government conducts procurement business.

#### **E. RECOMMENDATIONS FOR FURTHER RESEARCH**

##### **1. Develop a Classification for PBSA Performance Metrics**

There is an emphasis on measuring performance within PBSA but there is not a standard set of metrics that would enable an activity to easily quantify or qualify their performance. A standardized set of metric could be a baseline that activities could use as appropriate and still develop and tailor their own metrics.

## **2. Conduct an Analysis of Current PBSA Contracts**

An analysis of logistics services contracts such as the Balkans Support Contract and the LOGCAP Contract could add to the body of knowledge regarding PBSA.

## **3. Develop a Classification for a Different Service**

Develop a classification scheme for a different service or evaluate the Allen model using a different service. There are many opportunities to examine the classification scheme within the PBSA framework.

## **F. SUMMARY**

This chapter presented conclusions and recommendations from this research. It also provided answers to the primary and subsidiary research questions. The chapter concluded with recommendations for areas of further research.

## APPENDIX A. DATA COLLECTION PACKAGE

Naval Postgraduate School  
Monterey, CA 93943-5000  
(831) 649-4648 (hm)

My name is Don Hughes, LCDR, SC, USN, and I am a student in contract management at the U.S. Naval Postgraduate School. I earnestly need your assistance in an effort to further develop a classification scheme for Government procured services. Briefly:

A Classification Model has been developed into a Matrix based on an existing model created and refined by previous Naval Postgraduate School thesis students (Wenger, 1990 & Allen, 1991). I am in the process of analyzing selected logistics services to determine how and where they strategically fit into this model.

This Matrix needs to be tested and refined. It would be of TREMENDOUS help if, *based on your expertise in Government procurement, you would spend 20 to 45 minutes to fill out the attached Matrix and return it to me as soon as possible.*

The Matrix contains a list of thirty services, selected from OMB Circular A-76 and derived from Standard Industrial Classification (SIC) codes, as well as twelve characteristics with which to grade them. By grading each service with those characteristics, and listing your Top Three Characteristics, you will enable me to conduct robust analysis to select an optimal list of characteristics. If you choose to assist in this effort, the following procedure is suggested:

- (1) Read the definition (attached) of the first characteristic;
- (2) Grade each service (1-5) using the scale that follows the characteristic's definition. Please note - **scales should be read closely since some may appear to be counter intuitive**
- (3) Repeat steps (1) & (2) for each of the twelve characteristic's



(4) write your Top Three Characteristics (in order of strategic importance) on the right side of the Matrix for each service.

If you wish to provide comments on characteristic definitions or scales, please write them on the back of the Matrix.

Your input will be used to develop a taxonomy (classification) that will increase the body of knowledge of Government contract management. Your assistance would also be invaluable to me, personally, and in any event I would like to sincerely thank you for taking the time to assist me in this effort.

Very Respectfully,

D. S. Hughes

## CHARACTERISTIC DEFINITIONS & SCALES

The following characteristic definitions, and their associated scales, are designed to classify services on a strategic range, from the relatively simple to the complex.

1. **Customization** is the degree to which the production of a service is modified from standard commercial practice to conform to a buyer's unique specifications. All services are modified to some degree in consideration of circumstances unique to each customer, but they will differ on the magnitude to which important procedures, or the entire service process, are exceptionally customized for a buyer. In general, a greater degree of customization will increase the amount of buyer attention, and contract cost, necessary to ensure successful service performance.

### Scale

- 1 - No customization
- 2 - Customization does not substantively alter service production
- 3 - Customization substantively alters a few important elements of service production
- 4 - Customization substantively alters the bulk of important elements of service production
- 5 - The service is produced exclusively for the Government

2. **Expertise** is the degree of professional certification, skill, and experience required of the principal service production personnel to produce a service at an acceptable quality level. Higher levels of required expertise will usually increase the difficulty of evaluating service performance, as well as the extent to which a buyer should validate the qualifications of service provider personnel.

### Scale

- 1 - No expertise needed by principal service production personnel
- 2 - Expertise needed requires brief or inexpensive training/qualification
- 3 - Expertise needed requires moderately lengthy or moderately expensive training/qualification
- 4 - Expertise needed requires very lengthy or very expensive training/qualification
- 5 - Expertise needed requires extremely lengthy or extremely costly training/qualification

3. **Complexity** is the degree of technical complexity of techniques or equipment used in the scope of service production. Typically, a high degree of technical complexity will require that a buyer devote substantial attention to evaluating the skill level or equipment required to produce a service, as well as evaluating potential providers for those capabilities.

Scale

- 1 - Technical complexity is rudimentary
- 2 - Technical complexity is modest
- 3 - Technical complexity is sophisticated
- 4 - Technical complexity is advanced
- 5 - Technical complexity is on the frontier of human knowledge and capabilities

4. **Labor Percentage of Cost** is the degree to which total service cost is expended on provider labor (as opposed to material and equipment). The proportion of labor to material and equipment required to perform a service should affect buyer validation of provider qualifications, especially in the realm of financing.

Scale

- 1 - A modest amount of total service cost is expended on labor
- 2 - A moderate amount of total service cost is expended on labor
- 3 - The bulk of total service cost is expended on labor
- 4 - The vast preponderance of total service cost is expended on labor
- 5 - Almost all of total service cost is expended on labor

5. **Measurability** is the degree of effort necessary to describe and measure acceptable service performance. While performance of some services is obvious and readily measured, others may necessitate extensive description and detailed review by a buyer to determine if service performance satisfies buyer requirements.

Scale NOTE: SCALE MAY APPEAR TO BE COUNTER-INTUITIVE

- 1 - Description and measurement of acceptable service performance is obvious and almost effortless
- 2 - Description and measurement of acceptable service performance is uncomplicated

- 3 - Description and measurement of acceptable service performance is moderately difficult
- 4 - Description and measurement of acceptable service performance is quite complex
- 5 - Description and measurement of acceptable service performance is profoundly perplexing and intricate

6. **Confidentiality** is the degree to which release of information produced by, or required to produce, a service may be detrimental to either the buyer or service provider. The magnitude of potential damage, whether it be financial, competitive, related to reputation, or to national security, from a release of service information determines the level of service confidentiality. A high grade of confidentiality should necessitate extensive buyer validation of provider qualifications for controlling confidential information.

#### Scale

- 1 - Release of service production information is not at all potentially detrimental to the provider or Government
- 2 - Release of service production information would potentially cause inconsequential damage to the provider or Government
- 3 - Release of service production information would potentially cause notable damage to the provider or Government
- 4 - Release of service production information would potentially cause extensive damage to the provider or Government
- 5 - Release of service production information would potentially cause enormous damage to the provider or Government

7. **Risk to the Government** is the likelihood and magnitude of potential harm to the Government that would result if a service is not completed in accordance with cost, schedule, or performance specifications. Buyer attention should increase throughout the entire procurement process as the degree of risk to the Government escalates.

#### Scale

- 1 - The likelihood and magnitude of potential harm to the Government due to service performance failure is insignificant

- 2 - The likelihood and magnitude of potential harm to the Government due to service performance failure is slight
- 3 - The likelihood and magnitude of potential harm to the Government due to service performance failure is modest
- 4 - The likelihood and magnitude of potential harm to the Government due to service performance failure is substantial
- 5 - The likelihood and magnitude of potential harm to the Government due to service performance failure is enormous

8. **Buyer Attention** is the degree of time and effort that buyer personnel typically dedicate to procuring a service. Personnel allocation, work assignments, and other buyer organization plans and policies should vary with the distinctive degree of buyer attention customarily required by different types of services.

Scale

- 1 - Service procurement requires inconsequential time and effort from buyer personnel
- 2 - Service procurement requires minor time and effort from buyer personnel
- 3 - Service procurement requires moderate time and effort from buyer personnel
- 4 - Service procurement requires considerable time and effort from buyer personnel
- 5 - Service procurement requires extraordinary time and effort from buyer personnel

9. **Negotiation** is the degree to which price, schedule, and performance criteria are discussed and adjusted by the buyer and potential service providers during the service procurement process. More negotiation will generally require a longer and more detailed procurement effort.

Scale

- 1 - There is no negotiation between buyer and potential providers during the service procurement process
- 2 - Negotiation is insignificant between buyer and potential providers during the service procurement process
- 3 - Negotiation is meaningful between buyer and potential providers during the service procurement process
- 4 - Negotiation is extensive between buyer and potential providers during the service procurement process

5 - Negotiation is critical and comprehensive between buyer and potential providers during the service procurement process

10. **Competition** is the degree to which multiple, autonomous providers are willing and able to produce a service. Typically, the intensity of competition will influence buyer selection of contract type, as well as the extent to which price is the dominant source-selection factor.

Scale NOTE: SCALE MAY APPEAR TO BE COUNTER-INTUITIVE

1 - Numerous autonomous providers are willing and able to produce the service and are very aggressive in their willingness to do so

2 - It is quite easy to find several providers who are willing and able to produce the service

3 - It is uncomplicated to find a few autonomous providers who are willing and able to produce the service

4 - It is difficult to find a few autonomous providers who are willing and able to produce the service

5 - It is extremely difficult to find a provider willing and able to produce the service

11. **Stability** is the degree to which important schedule and performance criteria of a service remain the same over a period of time. A more stable service will typically require less attention on the part of the buyer.

Scale NOTE: SCALE MAY APPEAR TO BE COUNTER-INTUITIVE

1 - Any alteration to schedule or performance criteria is, at most, trivial for extremely lengthy periods of time

2 - Important schedule or performance criteria seldom undergo significant alteration

3 - Important schedule or performance criteria infrequently undergo significant alteration

4 - Important schedule or performance criteria frequently undergo significant alteration

5 - Important schedule or performance criteria almost constantly undergo significant alteration

12. **Perishability** is the length of time that the product of service performance is beneficial to, or consumed by, the buyer organization. A service with a relatively high degree of perishability will be consumed almost instantaneously, while the product of other services may provide benefits for many years.

Scale NOTE: *SCALE MAY APPEAR TO BE COUNTER-INTUITIVE*

- 1 - The period of benefit/consumption is immediate
- 2 - The period of benefit/consumption is brief
- 3 - The period of benefit/consumption is moderate
- 4 - The period of benefit/consumption is lengthy
- 5 - The period of benefit/consumption is extremely lengthy

THANK YOU FOR USING THESE DEFINITIONS AND SCALES!

SERVICE	Characteristics												TOP THREE CHARACTERISTICS IN ORDER OF STRATEGIC IMPORTANCE
	CUSTOMIZATION	EXPERTISE	COMPLEXITY	LABOR & COST	MEASURABILITY	CONFIDENTIALITY	RISK TO GOV'T	GOV'T ATTENTION	NEGOTIATION	COMPETITION	STABILITY	PERISHABILITY	
	1	2	3	4	5	6	7	8	9	10	11	12	
1. Audiovisual services													
2. Photographic processing													
3. Arts & Graphics services													
4. IT services - facilities management													
5. IT equipment, installation, ops & maintenance													
6. IT programming, design & analysis													
7. Food service operations													
8. Vending machine services													
9. Medical & Dental services													
10. OSHA services													
11. Machine, carpentry & electrical services													
12. Plumbing, Air conditioning & Heating services													
13. Fire prevention/protection services													
14. Custodial/Janitorial services													
15. Refuse collection & processing													
16. Financial & Payroll services													
17. Word processing, data entry													
18. Financial auditing services													
19. Material management													
20. Supply services													
21. Laundry/Dry-cleaning services													
22. Mapping & Charting services													
23. Training													
24. Base communication services													
25. Printing & reproduction services													
26. Landscaping													
27. Security													
28. Bus/shuttle service													
29. Motor pool operations													
30. Vehicle operations & maintenance													



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## **APPENDIX B. OMB CIRCULAR A-76 LIST OF SERVICES**

### **Audiovisual Products and Services**

- Photography (still, movie, aerial, etc.)
- Photographic processing (developing, printing, enlarging, etc.)
- Film and videotape production (script writing, direction, animation, editing, acting, etc.)
- Microfilming and other microforms
- Art and graphics services
- Distribution of audiovisual materials
- Reproduction and duplication of audiovisual products
- Audiovisual facility management and operation
- Maintenance of audiovisual equipment

### **Automatic Data Processing**

- ADP services - batch processing, time-sharing, facility management, etc.
- Programming and systems analysis, design, development, and simulation
- Key punching, data entry, transmission, and teleprocessing services
- Systems engineering and installation
- Equipment installation, operation, and maintenance

### **Food Services**

- Operation of cafeterias, mess halls, kitchens, bakeries, dairies, and commissaries
- Vending machines
- Ice and water

### **Health Services**

- Surgical, medical, dental, and psychiatric care
- Hospitalization, outpatient, and nursing care
- Physical examinations
- Eye and hearing examinations and manufacturing and fitting glasses and hearing aids
- Medical and dental laboratories
- Dispensaries
- Preventive medicine
- Dietary services
- Veterinary services

### **Industrial Shops and Services**

- Machine, carpentry, electrical, plumbing, painting, and other shops
- Industrial gas production and recharging
- Equipment and instrument fabrication, repair and calibration

Plumbing, heating, electrical, and air conditioning services, including repair  
Fire protection and prevention services  
Custodial and janitorial services  
Refuse collection and processing  
**Maintenance, Overhaul, Repair, and Testing**  
Aircraft and aircraft components  
Ships, boats, and components  
Motor vehicles  
Combat vehicles  
Railway systems  
Electronic equipment and systems  
Weapons and weapon systems  
Medical and dental equipment  
Office furniture and equipment  
Industrial plant equipment  
Photographic equipment  
Space systems  
**Management Support Services**  
Advertising and public relations services  
Financial and payroll services  
Debt collection  
**Manufacturing, Fabrication, Processing, Testing, and Packaging**  
Ordnance equipment  
Clothing and fabric products  
Liquid, gaseous, and chemical products  
Lumber products  
Communications and electronics equipment  
Rubber and plastic products  
Optical and related products  
Sheet metal and foundry products  
Machined products  
Construction materials  
Test and instrumentation equipment  
**Office and Administrative Services**  
Library operations  
Stenographic recording and transcribing  
Word processing/data entry/typing services  
Mail/messenger  
Translation  
Management information systems, products and distribution  
Financial auditing and services  
Compliance auditing  
Court reporting

- Material management
- Supply services
- Other Services**
  - Laundry and dry cleaning
  - Mapping and charting
  - Architect and engineer services
  - Geological surveys
  - Cataloging
  - Training -- academic, technical, vocational, and specialized Operation of utility systems (power, gas, water steam, and sewage)
  - Laboratory testing services
- Printing and Reproduction**
  - Facility management and operation
  - Printing and binding -- where the agency or department is exempted from the provisions of Title 44 of the U.S. Code
  - Reproduction, copying, and duplication
  - Blueprinting
- Real Property**
  - Design, engineering, construction, modification, repair, and maintenance of buildings and structures; building mechanical and electrical equipment and systems; elevators; escalators; moving walks
  - Construction, alteration, repair, and maintenance of roads and other surfaced areas
  - Landscaping, drainage, mowing and care of grounds
  - Dredging of waterways
- Security**
  - Guard and protective services
  - Systems engineering, installation, and maintenance of security systems and individual privacy systems
  - Forensic laboratories
- Special Studies and Analyses**
  - Cost benefit analyses
  - Statistical analyses
  - Scientific data studies
  - Regulatory studies
  - Defense, education, energy studies
  - Legal/litigation studies
  - Management studies
- Systems Engineering, Installation, Operation, Maintenance, and Testing**
  - Communications systems - voice, message, data, radio, wire, microwave, and satellite
  - Missile ranges

Satellite tracking and data acquisition  
Radar detection and tracking  
Television systems - studio and transmission  
equipment, distribution systems, receivers, antennas,  
etc.  
Recreational areas  
Bulk storage facilities

**Transportation**

Operation of motor pools  
Bus service  
Vehicle operation and maintenance  
Air, water, and land transportation of people and  
things  
Trucking and hauling

## APPENDIX C. MEAN VALUE MATRIX

	MEAN VALUE MATRIX											
Service	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
Audiovisual	1.78	2.41	2.15	2.67	2	2.15	2.11	2.22	2.26	1.74	1.7	2.7
Photographic processing	1.59	2.18	2.11	2.41	1.59	2.48	2.07	2.11	2.22	1.81	1.78	2.3
Arts & Graphics	2.11	2.56	2.3	2.74	2	2	2	2.15	2.3	1.93	1.81	2.67
IT Facilities Management	2.85	3.11	3	3.26	2.7	3.22	3.81	3.56	3.48	2.15	3.07	3.56
IT Equip, Install, Ops & Mntnce	2.7	3.37	3.22	2.67	2.89	3.22	3.74	3.81	3.63	2.11	3.22	3.56
IT Programming, design & analysis	3.56	3.93	3.78	3.85	3.41	4	3.63	4	4	2.3	3.22	3.85
Food Service ops	2.04	1.89	1.59	3.56	1.96	1.07	2.19	2.63	2.59	1.93	1.85	2.15
Vending Machine ops	1.56	1.37	1.26	2.67	1.37	1.04	1.63	1.52	1.89	1.59	1.48	2.22
Medical & Dental	2.07	4.04	3.11	3.3	3	2	3.41	3.26	3.04	2.74	2.15	3.07
OSHA	1.85	2.96	2.11	3.33	2.81	1.78	2.67	2.37	2.07	2.7	1.81	2.48
Machine, carpentry & electrical	1.63	2.3	1.81	3.11	2.52	1.29	2.56	2.3	2.33	1.67	1.93	3.07
Plumbing, AC & Heating	1.63	2.59	1.89	2.88	2.3	1.29	2.52	2.33	2.33	1.67	1.93	3.19
Fire prevention/protection	1.81	2.81	2	3.19	2.44	1.44	3.7	2.59	2.67	2.26	1.96	2.7
Custodial/Janitor	1.44	1.3	1.15	3.44	1.7	1.18	2	2.22	2.59	1.59	2.15	2.37
Refuse Collection & Processing	1.44	1.48	1.26	3.37	1.48	1.44	2.33	2	2.18	1.63	2	2.56
Financial & Payroll	2.7	2.59	2.3	3.59	2.63	2.7	3.26	2.74	2.74	2.41	2.04	3.11
Word Processing & Data Entry	1.74	1.89	1.41	3.44	2.19	1.7	2.33	2	1.96	1.74	2	2.48
Financial Auditing	2.63	2.93	2.48	3.85	2.7	2.74	2.89	2.59	2.7	2.07	2.15	2.74
Material Management	2.56	2.37	2.47	3	2.56	2.3	3.22	2.96	2.89	2.44	2.56	3.3
Supply services	2.74	2.37	2.15	3	2.59	2.11	3.15	2.74	2.81	2.37	2.52	3
Laundry & Dry-Cleaning	1.56	1.07	1.33	3.04	1.78	1.15	1.7	1.67	2	1.7	1.89	2.04
Mapping & Charting	2.22	2.56	2.33	3.19	2.41	2.37	2.78	2.26	2.41	2.33	2.18	2.74
Training	3	3	2.3	3.63	3.26	2.44	2.85	2.74	2.89	2.41	2.48	3.07
Base Communications	2.7	2.59	2.22	2.78	2.81	2.85	3.74	3.04	2.93	2.33	2.59	3.15
Printing, copying & duplication	1.63	1.89	1.85	2.74	1.85	2.11	2.44	2.11	1.81	1.74	2.22	2.18
Landscaping	1.67	1.67	1.52	3.19	2	1.15	1.3	2.04	2.22	1.52	1.96	3
Security	3	2.63	2	3.81	2.15	3.52	3.89	2.85	2.7	2.11	2.37	3.19
Bus/shuttle	1.63	1.52	1.37	3.11	1.37	1.7	1.89	2.11	1.96	1.63	2.26	2.22
Motor pool ops	2.15	2.07	1.59	3.11	1.81	1.67	2.26	2.11	2.07	2	1.89	2.59
Vehicle Ops & maintenance	2	2.78	1.85	3	2.22	1.7	2.22	2.41	2.22	2.04	2.22	2.59

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## APPENDIX D. INDIVIDUAL SERVICE CLASSIFICATIONS

	SERVICE:		AUDIOVISUAL			
						N = 27
			CATEGORY			
		Non-		Inter-		
Characteristic	Avg	complex	Basic	mediate	Advanced	Complex
	Value	1.0-1.80	1.81-2.60	2.61-3.40	3.41-4.20	4.21-5.0
Customization	1.78	+				
Expertise	2.41		+			
Complexity	2.15		0			
Labor & Cost	2.67			-		
Measurability	2		-			
Confidentiality	2.15		0			
Risk to Govt	2.11		0			
Govt Attention	2.22		0			
Negotiation	2.26		0			
Competition	1.74	+				
Stability	1.7	+				
Perishability	2.7			-		
		Group 1				
		Audiovisual products and services				
		1 of 3				
Key:						
-	= Mean value for a characteristic is in the lower 1/3 of a category range					
0	= Mean value for a characteristic is in the middle 1/3 of a category range					
+	= Mean value for a characteristic is in the upper 1/3 of a category range					



	<b>SERVICE:</b>		<b>PHOTOGRAPHIC PROCESSING</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		Non-		Inter-		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	1.59	+				
Expertise	2.18		0			
Complexity	2.11		0			
Labor % of Cost	2.41		+			
Measurability	1.59	+				
Confidentiality	2.48		+			
Risk to Govt	2.07		-			
Govt Attention	2.11		0			
Negotiation	2.22		0			
Competition	1.81		-			
Stability	1.78	+				
Perishability	2.3		0			
		Group 1				
		Audiovisual products and services				
		2 of 3				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	<b>SERVICE:</b>		<b>ARTS AND GRAPHICS</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	2.11		0			
Expertise	2.56		+			
Complexity	2.3		0			
Labor % of Cost	2.74			-		
Measurability	2		-			
Confidentiality	2		-			
Risk to Govt	2		-			
Govt Attention	2.15		0			
Negotiation	2.3		0			
Competition	1.93		-			
Stability	1.81		-			
Perishability	2.67			-		
		<b>Group 1</b>				
		<b>Audiovisual products and services</b>				
		<b>3 of 3</b>				
<b>Key:</b>						
<b>- = Mean value for a characteristic is in the lower 1/3 of a category range</b>						
<b>0 = Mean value for a characteristic is in the middle 1/3 of a category range</b>						
<b>+ = Mean value for a characteristic is in the upper 1/3 of a category range</b>						

	<b>SERVICE:</b>		<b>IT - FACILITIES MANAGEMENT</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	2.85			-		
Expertise	3.11			0		
Complexity	3			0		
Labor % of Cost	3.26			+		
Measurability	2.7			-		
Confidentiality	3.22			+		
Risk to Govt	3.81				0	
Govt Attention	3.56				-	
Negotiation	3.48				-	
Competition	2.15		0			
Stability	3.07			0		
Perishability	3.56				-	
		<b>Group 2</b>				
		<b>Information Technology services</b>				
		<b>1 of 3</b>				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	<b>SERVICE:</b>		<b>IT - EQUIPMENT, INSTALLATION,</b>			
			<b>OPS &amp; MAINTENANCE</b>			<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	2.7			-		
Expertise	3.37			+		
Complexity	3.22			+		
Labor % of Cost	2.67			-		
Measurability	2.89			0		
Confidentiality	3.22			+		
Risk to Govt	3.74				0	
Govt Attention	3.81				0	
Negotiation	3.63				-	
Competition	2.11		0			
Stability	3.22			+		
Perishability	3.56				-	
		<b>Group 2</b>				
		<b>Information Technology services</b>				
		<b>2 of 3</b>				
<b>Key:</b>						
<b>- = Mean value for a characteristic is in the lower 1/3 of a category range</b>						
<b>0 = Mean value for a characteristic is in the middle 1/3 of a category range</b>						
<b>+ = Mean value for a characteristic is in the upper 1/3 of a category range</b>						

	<b>SERVICE:</b>		<b>IT Programming, design &amp; analysis</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		Non-		Inter-		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	3.56				-	
Expertise	3.93				0	
Complexity	3.78				0	
Labor % of Cost	3.85				0	
Measurability	3.41				-	
Confidentiality	4				+	
Risk to Govt	3.63				-	
Govt Attention	4				+	
Negotiation	4				+	
Competition	2.3		0			
Stability	3.22			+		
Perishability	3.85				0	
		<b>Group 2</b>				
		<b>Information Technology services</b>				
		<b>3 of 3</b>				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	<b>SERVICE:</b>		<b>FOOD SERVICE OPERATIONS</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		Non-		Inter-		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	2.04		-			
Expertise	1.89		-			
Complexity	1.59	+				
Labor % of Cost	3.56				-	
Measurability	1.96		-			
Confidentiality	1.07	-				
Risk to Govt	2.19		0			
Govt Attention	2.63			-		
Negotiation	2.59		+			
Competition	1.93		-			
Stability	1.85		-			
Perishability	2.15		0			
		Group 3				
		Food Services				
		1 of 2				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	<b>SERVICE:</b>		<b>VENDING MACHINE OPERATIONS</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	1.56	+				
Expertise	1.37	0				
Complexity	1.26	-				
Labor % of Cost	2.67			-		
Measurability	1.37	0				
Confidentiality	1.04	-				
Risk to Govt	1.63	+				
Govt Attention	1.52	0				
Negotiation	1.89		-			
Competition	1.59	+				
Stability	1.48	0				
Perishability	2.22		0			
		Group 3				
		Food Services				
		2 of 2				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	<b>SERVICE:</b>		<b>MEDICAL AND DENTAL</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
<b>Customization</b>	<b>2.07</b>		<b>-</b>			
<b>Expertise</b>	<b>4.04</b>				<b>+</b>	
<b>Complexity</b>	<b>3.11</b>			<b>0</b>		
<b>Labor % of Cost</b>	<b>3.3</b>			<b>+</b>		
<b>Measurability</b>	<b>3</b>			<b>0</b>		
<b>Confidentiality</b>	<b>2</b>		<b>-</b>			
<b>Risk to Govt</b>	<b>3.41</b>				<b>-</b>	
<b>Govt Attention</b>	<b>3.26</b>			<b>+</b>		
<b>Negotiation</b>	<b>3.04</b>			<b>0</b>		
<b>Competition</b>	<b>2.74</b>			<b>-</b>		
<b>Stability</b>	<b>2.15</b>		<b>0</b>			
<b>Perishability</b>	<b>3.07</b>			<b>0</b>		
		<b>Group 4</b>				
		<b>Health services</b>				
		<b>1 of 2</b>				
<b>Key:</b>						
<b>- = Mean value for a characteristic is in the lower 1/3 of a category range</b>						
<b>0 = Mean value for a characteristic is in the middle 1/3 of a category range</b>						
<b>+ = Mean value for a characteristic is in the upper 1/3 of a category range</b>						



	<b>SERVICE:</b>		<b>OSHA</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
<b>Customization</b>	<b>1.85</b>		<b>-</b>			
<b>Expertise</b>	<b>2.96</b>			<b>0</b>		
<b>Complexity</b>	<b>2.11</b>		<b>0</b>			
<b>Labor % of Cost</b>	<b>3.33</b>			<b>+</b>		
<b>Measurability</b>	<b>2.81</b>			<b>-</b>		
<b>Confidentiality</b>	<b>1.78</b>	<b>+</b>				
<b>Risk to Govt</b>	<b>2.67</b>			<b>-</b>		
<b>Govt Attention</b>	<b>2.37</b>		<b>+</b>			
<b>Negotiation</b>	<b>2.07</b>		<b>-</b>			
<b>Competition</b>	<b>2.7</b>			<b>-</b>		
<b>Stability</b>	<b>1.81</b>		<b>-</b>			
<b>Perishability</b>	<b>2.48</b>		<b>+</b>			
		<b>Group 4</b>				
		<b>Health services</b>				
		<b>2 of 2</b>				
<b>Key:</b>						
<b>- = Mean value for a characteristic is in the lower 1/3 of a category range</b>						
<b>0 = Mean value for a characteristic is in the middle 1/3 of a category range</b>						
<b>+ = Mean value for a characteristic is in the upper 1/3 of a category range</b>						

	<b>SERVICE:</b>		<b>Machine, Carpentry &amp; Electric</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
<b>Customization</b>	<b>1.63</b>	<b>+</b>				
<b>Expertise</b>	<b>2.3</b>		<b>0</b>			
<b>Complexity</b>	<b>1.81</b>		<b>-</b>			
<b>Labor % of Cost</b>	<b>3.11</b>			<b>0</b>		
<b>Measurability</b>	<b>2.52</b>		<b>+</b>			
<b>Confidentiality</b>	<b>1.29</b>	<b>0</b>				
<b>Risk to Govt</b>	<b>2.56</b>		<b>+</b>			
<b>Govt Attention</b>	<b>2.3</b>		<b>0</b>			
<b>Negotiation</b>	<b>2.33</b>		<b>0</b>			
<b>Competition</b>	<b>1.67</b>	<b>+</b>				
<b>Stability</b>	<b>1.93</b>		<b>-</b>			
<b>Perishability</b>	<b>3.07</b>			<b>0</b>		
		<b>Group 5</b>				
		<b>Industrial shops and services</b>				
		<b>1 of 5</b>				
<b>Key:</b>						
<b>- = Mean value for a characteristic is in the lower 1/3 of a category range</b>						
<b>0 = Mean value for a characteristic is in the middle 1/3 of a category range</b>						
<b>+ = Mean value for a characteristic is in the upper 1/3 of a category range</b>						

	<b>SERVICE:</b>		<b>Plumbing, AC &amp; Heating</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
<b>Customization</b>	<b>1.63</b>	<b>+</b>				
<b>Expertise</b>	<b>2.59</b>		<b>+</b>			
<b>Complexity</b>	<b>1.89</b>		<b>-</b>			
<b>Labor % of Cost</b>	<b>2.88</b>			<b>0</b>		
<b>Measurability</b>	<b>2.3</b>		<b>0</b>			
<b>Confidentiality</b>	<b>1.29</b>	<b>0</b>				
<b>Risk to Govt</b>	<b>2.52</b>		<b>+</b>			
<b>Govt Attention</b>	<b>2.33</b>		<b>0</b>			
<b>Negotiation</b>	<b>2.33</b>		<b>0</b>			
<b>Competition</b>	<b>1.67</b>	<b>+</b>				
<b>Stability</b>	<b>1.93</b>		<b>-</b>			
<b>Perishability</b>	<b>3.19</b>			<b>+</b>		
		<b>Group 5</b>				
		<b>Industrial shops and services</b>				
		<b>2 of 5</b>				
<b>Key:</b>						
<b>- = Mean value for a characteristic is in the lower 1/3 of a category range</b>						
<b>0 = Mean value for a characteristic is in the middle 1/3 of a category range</b>						
<b>+ = Mean value for a characteristic is in the upper 1/3 of a category range</b>						

	<b>SERVICE:</b>		<b>Fire Prevention/Protection</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	1.81		-			
Expertise	2.81			-		
Complexity	2		-			
Labor % of Cost	3.19			+		
Measurability	2.44		+			
Confidentiality	1.44	0				
Risk to Govt	3.7				0	
Govt Attention	2.59		+			
Negotiation	2.67			-		
Competition	2.26		0			
Stability	1.96		-			
Perishability	2.7			-		
		<b>Group 5</b>				
		<b>Industrial shops and services</b>				
		<b>3 of 5</b>				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	SERVICE:		CUSTODIAL/JANITORIAL			
						N = 27
			CATEGORY			
		Non-		Inter-		
Characteristic	Avg	complex	Basic	mediate	Advanced	Complex
	Value	1.0-1.80	1.81-2.60	2.61-3.40	3.41-4.20	4.21-5.0
Customization	1.44	0				
Expertise	1.3	0				
Complexity	1.15	-				
Labor % of Cost	3.44				-	
Measurability	1.7	+				
Confidentiality	1.18	-				
Risk to Govt	2		-			
Govt Attention	2.22		0			
Negotiation	2.59		+			
Competition	1.59	+				
Stability	2.15		0			
Perishability	2.37		+			
		Group 5				
		Industrial shops and services				
		4 of 5				
Key:						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	<b>SERVICE:</b>		<b>REFUSE COLLECTION &amp; PROCESSING</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	1.44	0				
Expertise	1.48	0				
Complexity	1.26	-				
Labor % of Cost	3.37			+		
Measurability	1.48	0				
Confidentiality	1.44	0				
Risk to Govt	2.33		0			
Govt Attention	2		-			
Negotiation	2.18		0			
Competition	1.63	+				
Stability	2		-			
Perishability	2.56		+			
		Group 5				
		Industrial shops and services				
		5 of 5				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	<b>SERVICE:</b>		<b>FINANCIAL &amp; PAYROLL</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
<b>Customization</b>	<b>2.7</b>			<b>-</b>		
<b>Expertise</b>	<b>2.59</b>		<b>+</b>			
<b>Complexity</b>	<b>2.3</b>		<b>0</b>			
<b>Labor % of Cost</b>	<b>3.59</b>				<b>-</b>	
<b>Measurability</b>	<b>2.63</b>			<b>-</b>		
<b>Confidentiality</b>	<b>2.7</b>			<b>-</b>		
<b>Risk to Govt</b>	<b>3.26</b>			<b>+</b>		
<b>Govt Attention</b>	<b>2.74</b>			<b>-</b>		
<b>Negotiation</b>	<b>2.74</b>			<b>-</b>		
<b>Competition</b>	<b>2.41</b>		<b>+</b>			
<b>Stability</b>	<b>2.04</b>		<b>-</b>			
<b>Perishability</b>	<b>3.11</b>			<b>0</b>		
		<b>Group 6</b>				
		<b>Management Support services</b>				
		<b>1 of 1</b>				
<b>Key:</b>						
<b>- = Mean value for a characteristic is in the lower 1/3 of a category range</b>						
<b>0 = Mean value for a characteristic is in the middle 1/3 of a category range</b>						
<b>+ = Mean value for a characteristic is in the upper 1/3 of a category range</b>						

	<b>SERVICE:</b>		<b>WORD PROCESSING &amp; DATA ENTRY</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
<b>Customization</b>	<b>1.74</b>	<b>+</b>				
<b>Expertise</b>	<b>1.89</b>		<b>-</b>			
<b>Complexity</b>	<b>1.41</b>	<b>0</b>				
<b>Labor % of Cost</b>	<b>3.44</b>				<b>-</b>	
<b>Measurability</b>	<b>2.19</b>		<b>0</b>			
<b>Confidentiality</b>	<b>1.7</b>	<b>+</b>				
<b>Risk to Govt</b>	<b>2.33</b>		<b>0</b>			
<b>Govt Attention</b>	<b>2</b>		<b>-</b>			
<b>Negotiation</b>	<b>1.96</b>		<b>-</b>			
<b>Competition</b>	<b>1.74</b>	<b>+</b>				
<b>Stability</b>	<b>2</b>		<b>-</b>			
<b>Perishability</b>	<b>2.48</b>		<b>+</b>			
		<b>Group 7</b>				
		<b>Office and Administrative services</b>				
		<b>1 of 4</b>				
<b>Key:</b>						
<b>- = Mean value for a characteristic is in the lower 1/3 of a category range</b>						
<b>0 = Mean value for a characteristic is in the middle 1/3 of a category range</b>						
<b>+ = Mean value for a characteristic is in the upper 1/3 of a category range</b>						



	<b>SERVICE:</b>		<b>FINANCIAL AUDITING</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	3.63				-	
Expertise	2.93			0		
Complexity	2.48		+			
Labor % of Cost	3.85				0	
Measurability	2.7			-		
Confidentiality	2.74			-		
Risk to Govt	2.89			0		
Govt Attention	2.59		+			
Negotiation	2.7			-		
Competition	2.07		-			
Stability	2.15		0			
Perishability	2.74			-		
		Group 7				
		Office and Administrative services				
		2 of 4				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	SERVICE:		MATERIAL MANAGEMENT			
						N = 27
			CATEGORY			
		Non-		Inter-		
Characteristic	Avg	complex	Basic	mediate	Advanced	Complex
	Value	1.0-1.80	1.81-2.60	2.61-3.40	3.41-4.20	4.21-5.0
Customization	2.56		+			
Expertise	2.37		+			
Complexity	2.47		+			
Labor % of Cost	3			0		
Measurability	2.56		+			
Confidentiality	2.3		0			
Risk to Govt	3.22			+		
Govt Attention	2.96			0		
Negotiation	2.89			0		
Competition	2.44		+			
Stability	2.56		+			
Perishability	3.3			+		
		Group 7				
		Office and Administrative services				
		3 of 4				
Key:						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	<b>SERVICE:</b>		<b>SUPPLY</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		Non-		Inter-		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
<b>Customization</b>	<b>2.74</b>			-		
<b>Expertise</b>	<b>2.37</b>		+			
<b>Complexity</b>	<b>2.15</b>		0			
<b>Labor % of Cost</b>	<b>3</b>			0		
<b>Measurability</b>	<b>2.59</b>		+			
<b>Confidentiality</b>	<b>2.11</b>		-			
<b>Risk to Govt</b>	<b>3.15</b>			+		
<b>Govt Attention</b>	<b>2.74</b>			-		
<b>Negotiation</b>	<b>2.81</b>			-		
<b>Competition</b>	<b>2.37</b>		+			
<b>Stability</b>	<b>2.52</b>		+			
<b>Perishability</b>	<b>3</b>			0		
		<b>Group 7</b>				
		<b>Office and Administrative services</b>				
		<b>4 of 4</b>				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	<b>SERVICE:</b>		<b>LAUNDRY AND DRY-CLEANING</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		Non-		Inter-		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	1.56	+				
Expertise	1.07	-				
Complexity	1.33	0				
Labor % of Cost	3.04			0		
Measurability	1.78	+				
Confidentiality	1.15	-				
Risk to Govt	1.7	+				
Govt Attention	1.67	+				
Negotiation	2		-			
Competition	1.7	+				
Stability	1.89		-			
Perishability	2.04		-			
		Group 8				
		Other services				
		1 of 3				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	SERVICE:		MAPPING AND CHARTING			
						N = 27
			CATEGORY			
		Non-		Inter-		
Characteristic	Avg	complex	Basic	mediate	Advanced	Complex
	Value	1.0-1.80	1.81-2.60	2.61-3.40	3.41-4.20	4.21-5.0
Customization	2.22		0			
Expertise	2.56		+			
Complexity	2.33		0			
Labor % of Cost	3.19			+		
Measurability	2.41		+			
Confidentiality	2.37		+			
Risk to Govt	2.78			-		
Govt Attention	2.26		0			
Negotiation	2.41		+			
Competition	2.33		0			
Stability	2.18		0			
Perishability	2.74			-		
		Group 8				
		Other services				
		2 of 3				
Key:						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	<b>SERVICE:</b>		<b>TRAINING</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		Non-		Inter-		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
<b>Customization</b>	3			0		
<b>Expertise</b>	3			0		
<b>Complexity</b>	2.3		0			
<b>Labor % of Cost</b>	3.63				-	
<b>Measurability</b>	3.26			+		
<b>Confidentiality</b>	2.44		+			
<b>Risk to Govt</b>	2.85			-		
<b>Govt Attention</b>	2.74			-		
<b>Negotiation</b>	2.89			0		
<b>Competition</b>	2.41		+			
<b>Stability</b>	2.48		+			
<b>Perishability</b>	3.07			0		
		Group 8				
		Other services				
		3 of 3				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	SERVICE:		BASE COMMUNICATIONS			
						N = 27
			CATEGORY			
		Non-		Inter-		
Characteristic	Avg	complex	Basic	mediate	Advanced	Complex
	Value	1.0-1.80	1.81-2.60	2.61-3.40	3.41-4.20	4.21-5.0
Customization	2.7			-		
Expertise	2.59		+			
Complexity	2.22		0			
Labor % of Cost	2.78			-		
Measurability	2.81			-		
Confidentiality	2.85			-		
Risk to Govt	3.74				0	
Govt Attention	3.04			0		
Negotiation	2.93			0		
Competition	2.33		0			
Stability	2.59		+			
Perishability	2.15		0			
		Group 9				
		Communications systems				
		1 of 1				
Key:						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	SERVICE:		Printing, copying & duplication			
						N = 27
			CATEGORY			
		Non-		Inter-		
Characteristic	Avg	complex	Basic	mediate	Advanced	Complex
	Value	1.0-1.80	1.81-2.60	2.61-3.40	3.41-4.20	4.21-5.0
Customization	1.63	+				
Expertise	1.89		-			
Complexity	1.85		-			
Labor % of Cost	2.74			-		
Measurability	1.85		-			
Confidentiality	2.11		0			
Risk to Govt	2.44		+			
Govt Attention	2.11		0			
Negotiation	1.81		-			
Competition	1.74	+				
Stability	2.22		0			
Perishability	2.18		0			
		Group 10				
		Printing and Reproduction				
		1 of 1				
Key:						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						



	<b>SERVICE:</b>		<b>LANDSCAPING</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		Non-		Inter-		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	1.67	+				
Expertise	1.67	+				
Complexity	1.52	0				
Labor % of Cost	3.19			+		
Measurability	2		-			
Confidentiality	1.15	-				
Risk to Govt	1.3	0				
Govt Attention	2.04		-			
Negotiation	2.22		0			
Competition	1.52	0				
Stability	1.96		-			
Perishability	3			0		
		Group 11				
		Real Property				
		1 of 1				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

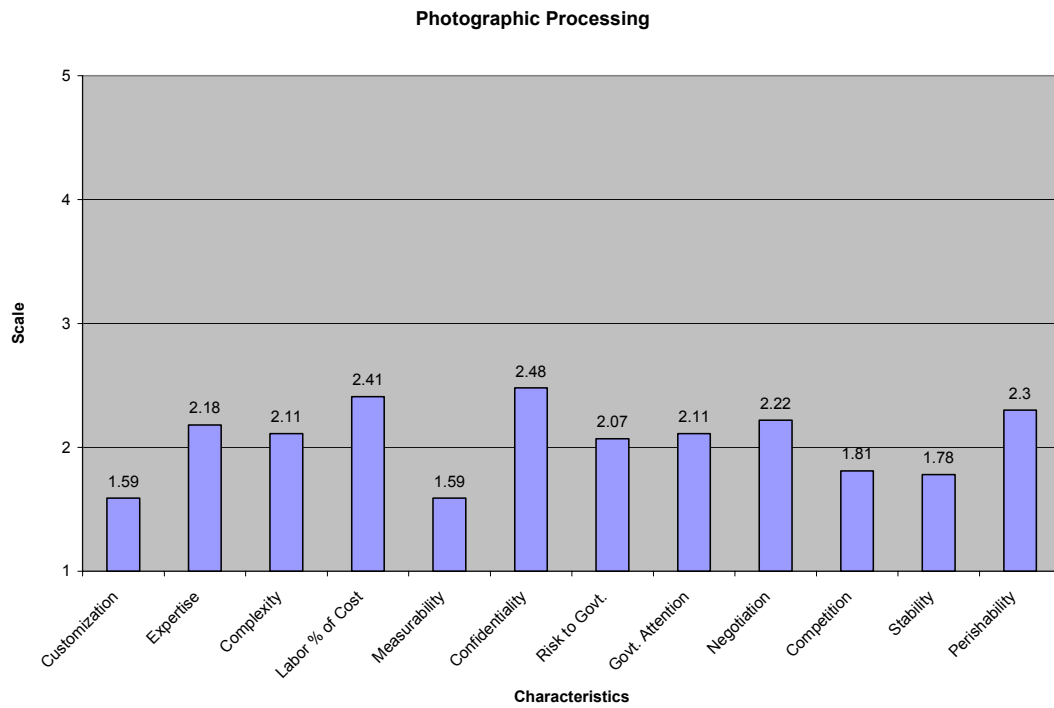
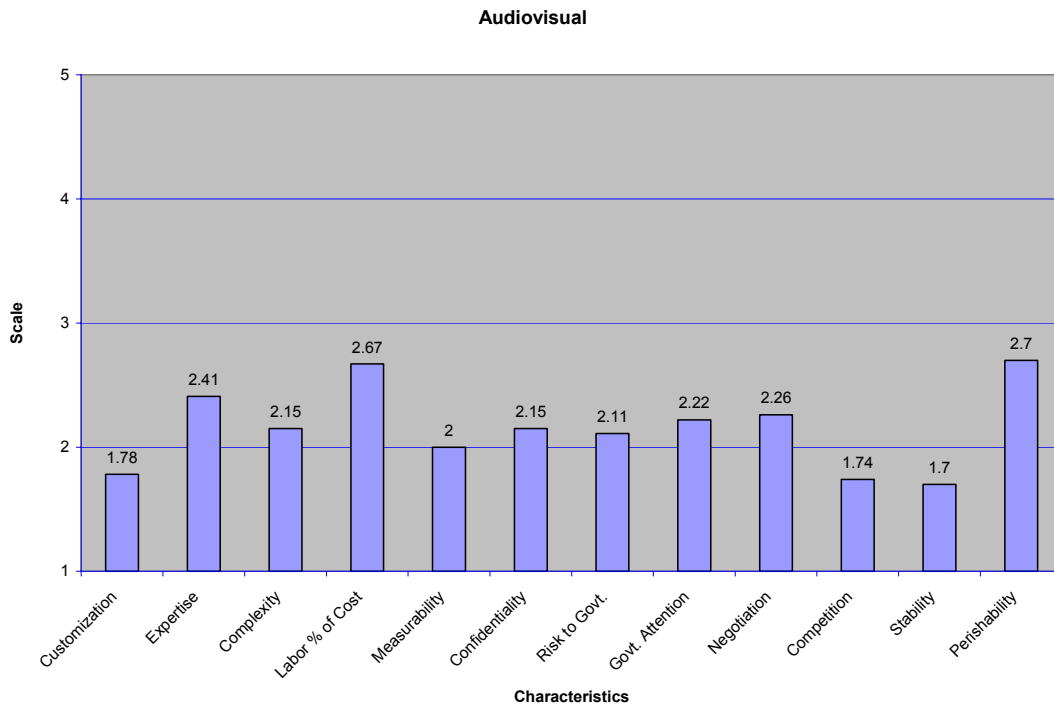
	<b>SERVICE:</b>		<b>SECURITY</b>			
						N = 27
			<b>CATEGORY</b>			
		Non-		Inter-		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
Customization	3			0		
Expertise	2.63			-		
Complexity	2		-			
Labor % of Cost	3.81				0	
Measurability	2.15		0			
Confidentiality	3.52				-	
Risk to Govt	3.89				0	
Govt Attention	2.85			-		
Negotiation	2.7			-		
Competition	2.11		-			
Stability	2.37		+			
Perishability	3.19			+		
		Group 12				
		Security				
		1 of 1				
<b>Key:</b>						
- = Mean value for a characteristic is in the lower 1/3 of a category range						
0 = Mean value for a characteristic is in the middle 1/3 of a category range						
+ = Mean value for a characteristic is in the upper 1/3 of a category range						

	<b>SERVICE:</b>		<b>BUS AND SHUTTLE</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
<b>Customization</b>	<b>1.63</b>	<b>+</b>				
<b>Expertise</b>	<b>1.52</b>	<b>0</b>				
<b>Complexity</b>	<b>1.37</b>	<b>0</b>				
<b>Labor % of Cost</b>	<b>3.11</b>			<b>0</b>		
<b>Measurability</b>	<b>1.37</b>	<b>0</b>				
<b>Confidentiality</b>	<b>1.7</b>	<b>+</b>				
<b>Risk to Govt</b>	<b>1.89</b>		<b>-</b>			
<b>Govt Attention</b>	<b>2.11</b>		<b>0</b>			
<b>Negotiation</b>	<b>1.96</b>		<b>-</b>			
<b>Competition</b>	<b>1.63</b>	<b>+</b>				
<b>Stability</b>	<b>2.26</b>		<b>0</b>			
<b>Perishability</b>	<b>2.22</b>		<b>0</b>			
		<b>Group 13</b>				
		<b>Transportation</b>				
		<b>1 of 3</b>				
<b>Key:</b>						
<b>- = Mean value for a characteristic is in the lower 1/3 of a category range</b>						
<b>0 = Mean value for a characteristic is in the middle 1/3 of a category range</b>						
<b>+ = Mean value for a characteristic is in the upper 1/3 of a category range</b>						

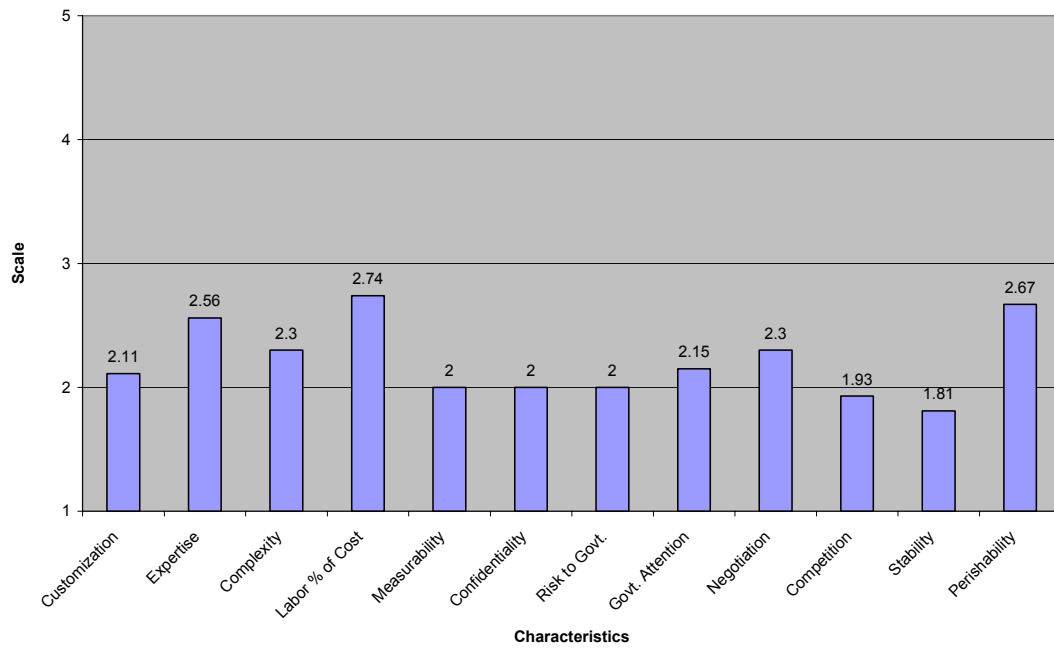
	<b>SERVICE:</b>		<b>Vehicle ops &amp; maintenance</b>			
						<b>N = 27</b>
			<b>CATEGORY</b>			
		<b>Non-</b>		<b>Inter-</b>		
<b>Characteristic</b>	<b>Avg</b>	<b>complex</b>	<b>Basic</b>	<b>mediate</b>	<b>Advanced</b>	<b>Complex</b>
	<b>Value</b>	<b>1.0-1.80</b>	<b>1.81-2.60</b>	<b>2.61-3.40</b>	<b>3.41-4.20</b>	<b>4.21-5.0</b>
<b>Customization</b>	<b>2</b>		<b>-</b>			
<b>Expertise</b>	<b>2.78</b>			<b>-</b>		
<b>Complexity</b>	<b>1.85</b>		<b>-</b>			
<b>Labor % of Cost</b>	<b>3</b>			<b>0</b>		
<b>Measurability</b>	<b>2.22</b>		<b>0</b>			
<b>Confidentiality</b>	<b>1.7</b>	<b>+</b>				
<b>Risk to Govt</b>	<b>2.22</b>		<b>0</b>			
<b>Govt Attention</b>	<b>2.41</b>		<b>+</b>			
<b>Negotiation</b>	<b>2.22</b>		<b>0</b>			
<b>Competition</b>	<b>2.04</b>		<b>-</b>			
<b>Stability</b>	<b>2.22</b>		<b>0</b>			
<b>Perishability</b>	<b>2.59</b>		<b>+</b>			
		<b>Group 13</b>				
		<b>Transportation</b>				
		<b>3 of 3</b>				
<b>Key:</b>						
<b>- = Mean value for a characteristic is in the lower 1/3 of a category range</b>						
<b>0 = Mean value for a characteristic is in the middle 1/3 of a category range</b>						
<b>+ = Mean value for a characteristic is in the upper 1/3 of a category range</b>						

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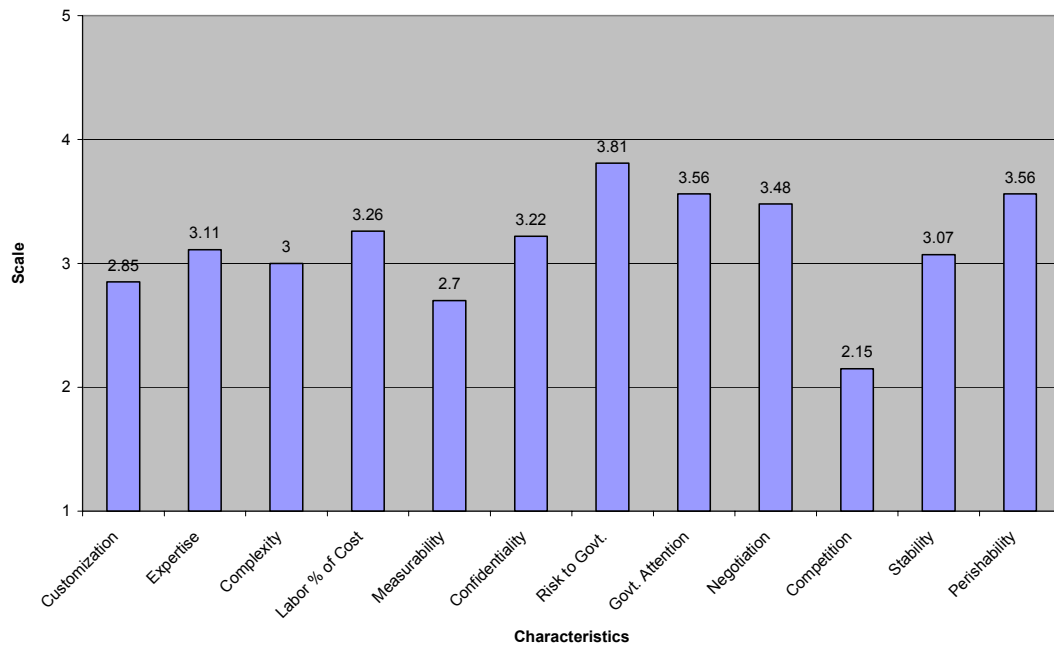
## APPENDIX E. BAR GRAPHS FOR INDIVIDUAL SERVICES



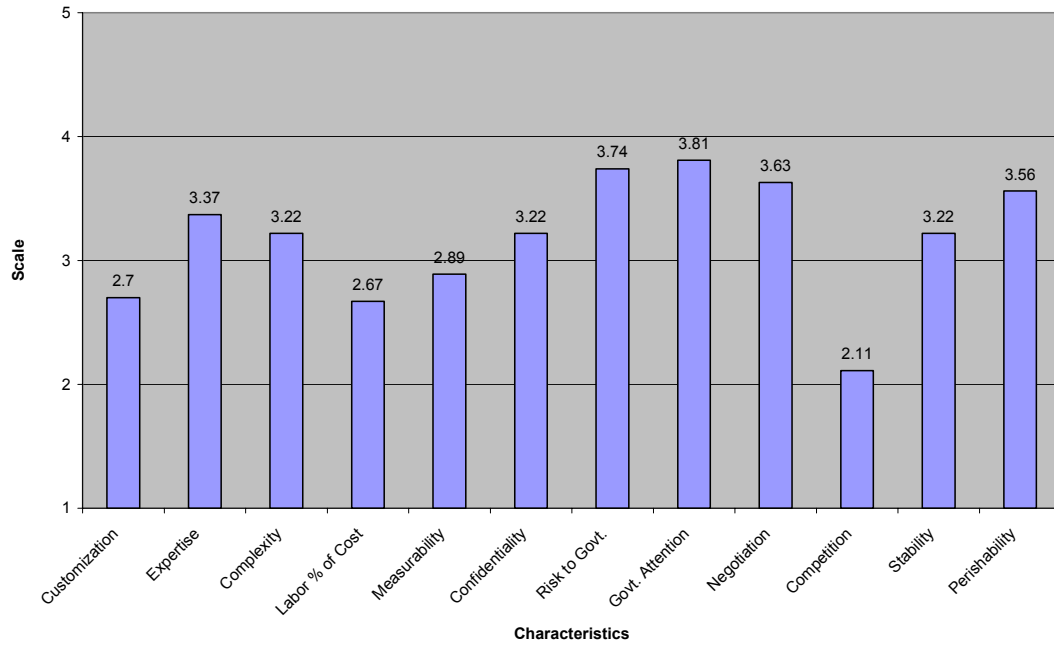
### Arts & Graphics



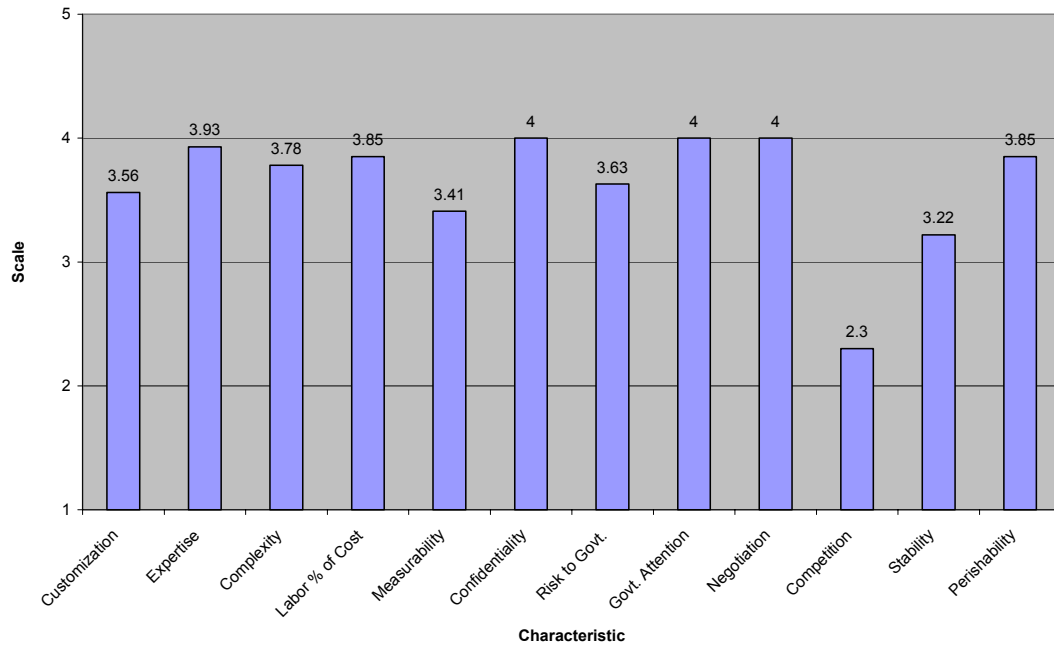
### IT Facilities Management



### IT Equipment, Installation, Ops & Maintenance

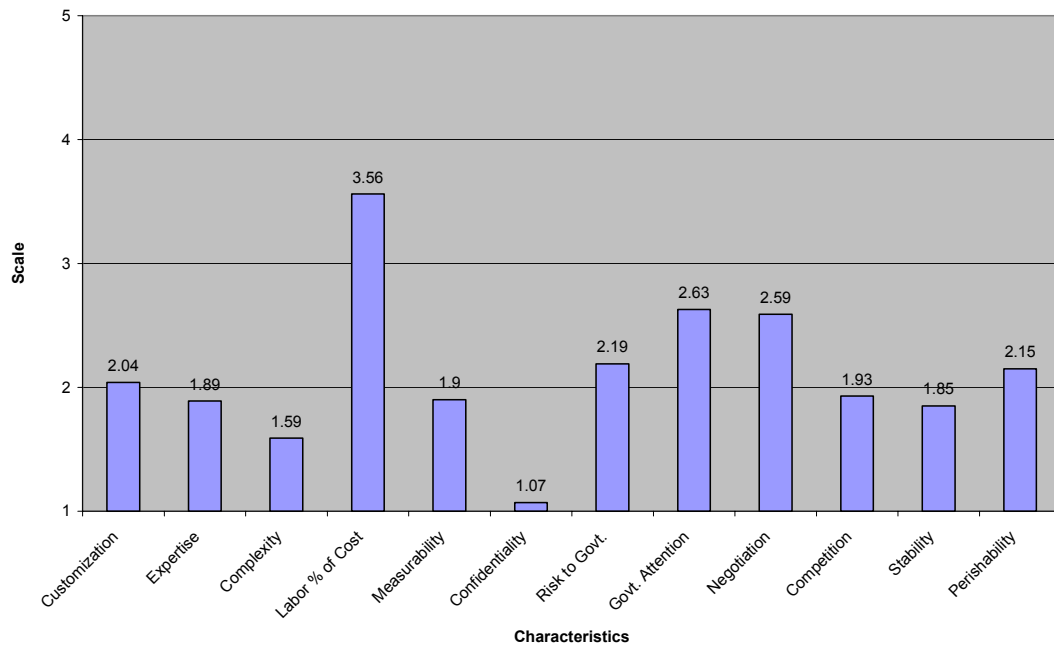


### IT Programming, Design & Analysis

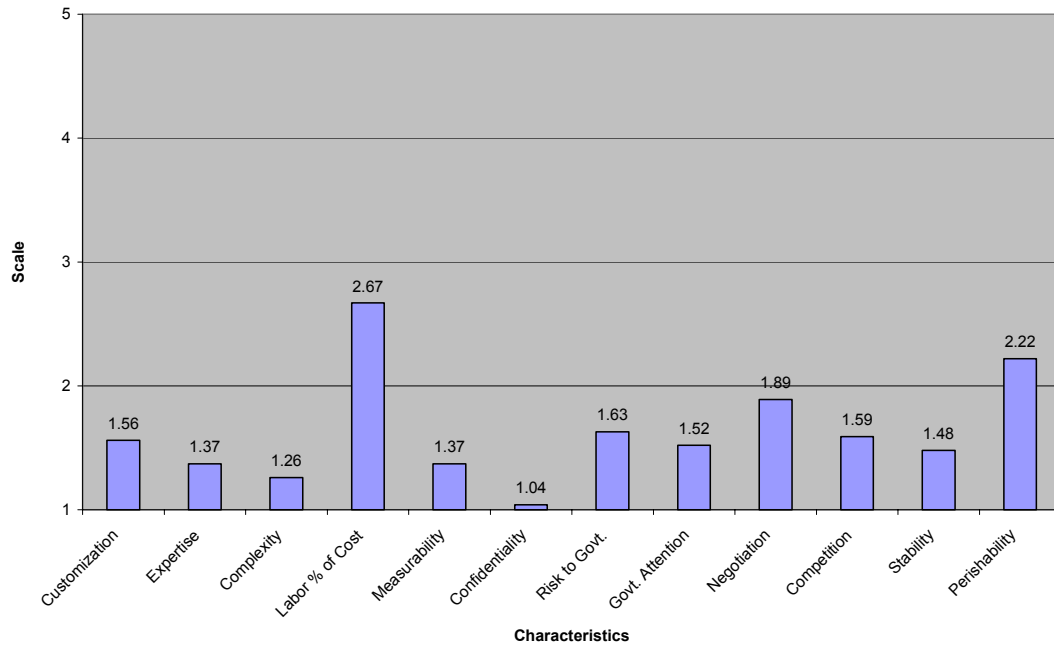




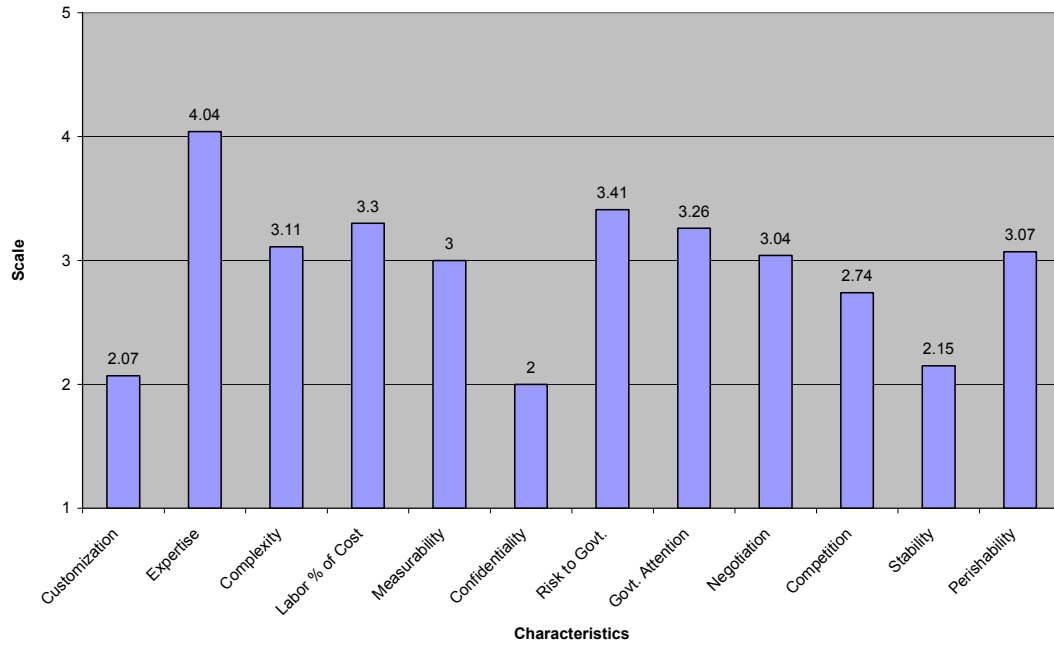
### Food Service Operations



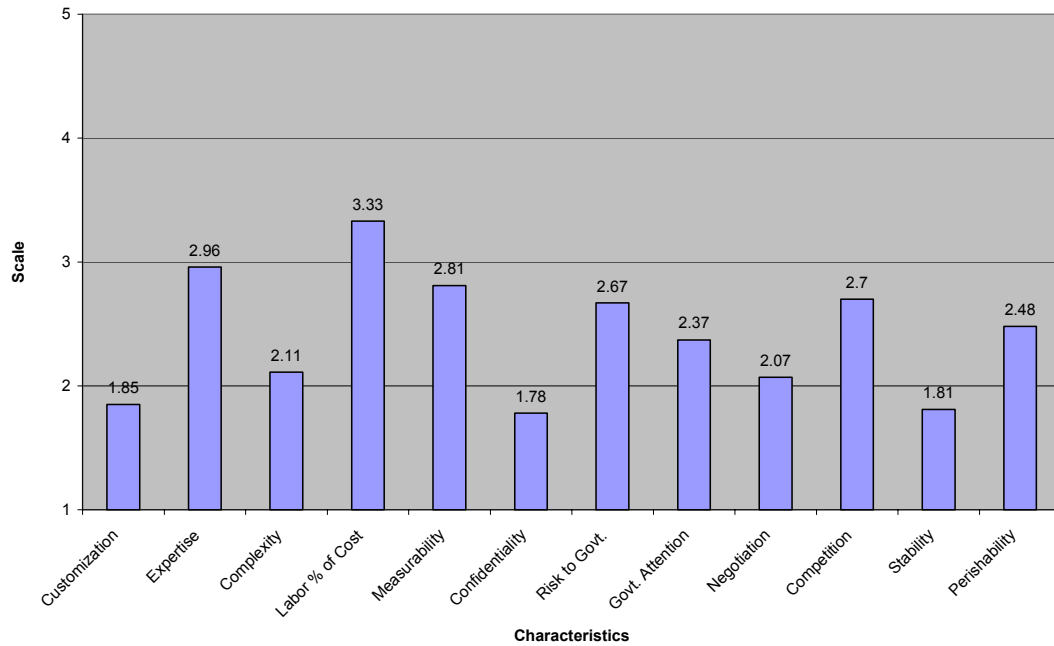
### Vending Machine Operations



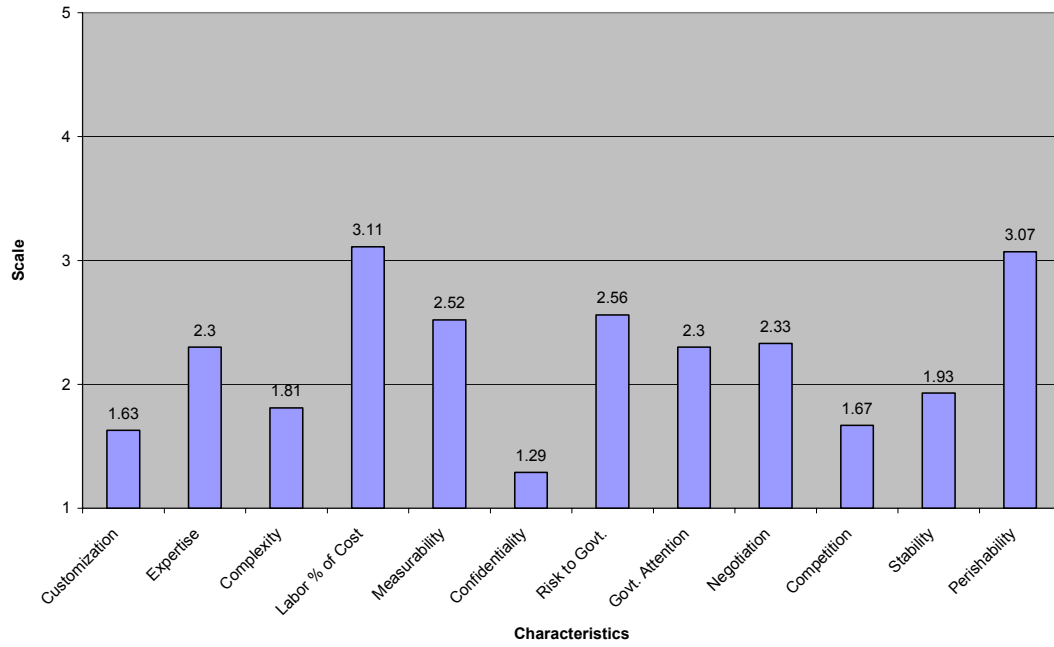
### Medical and Dental



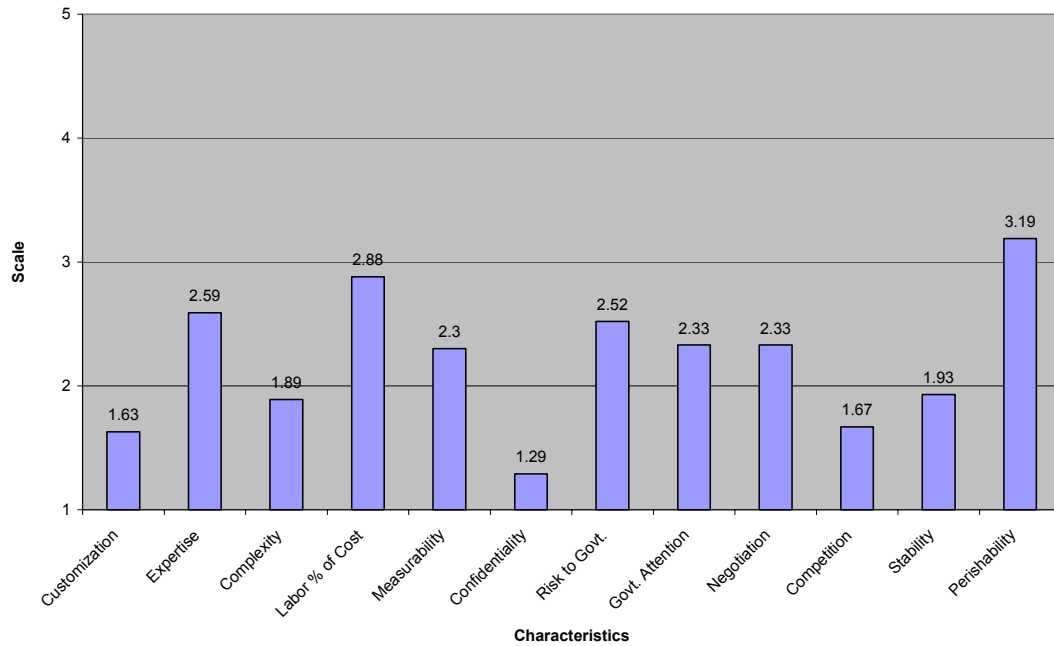
### OSHA



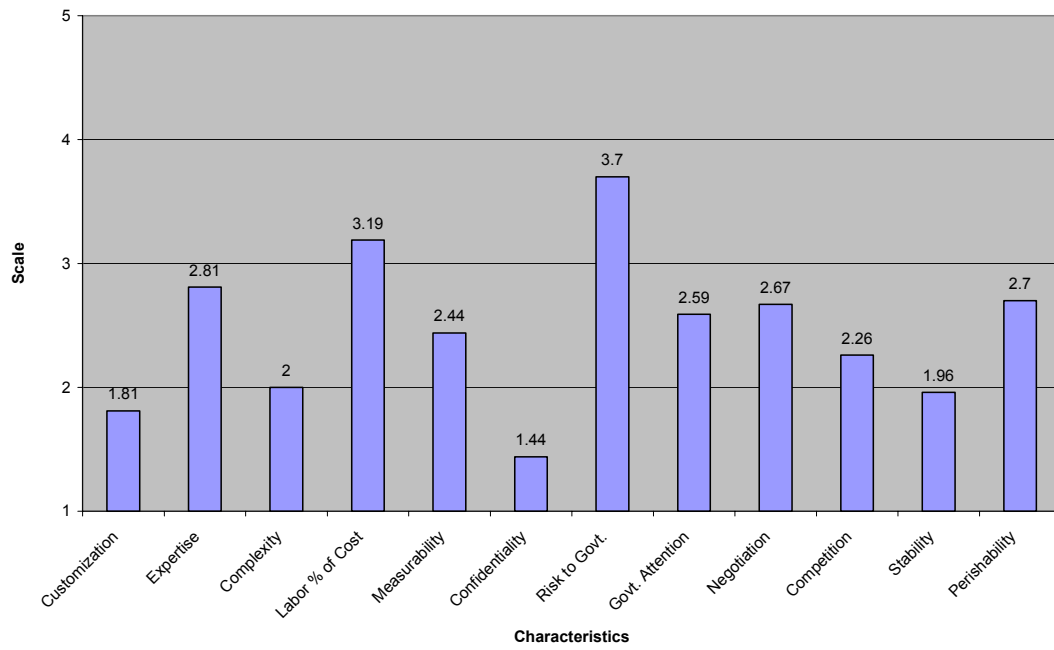
### Machine, Carpentry & Electrical



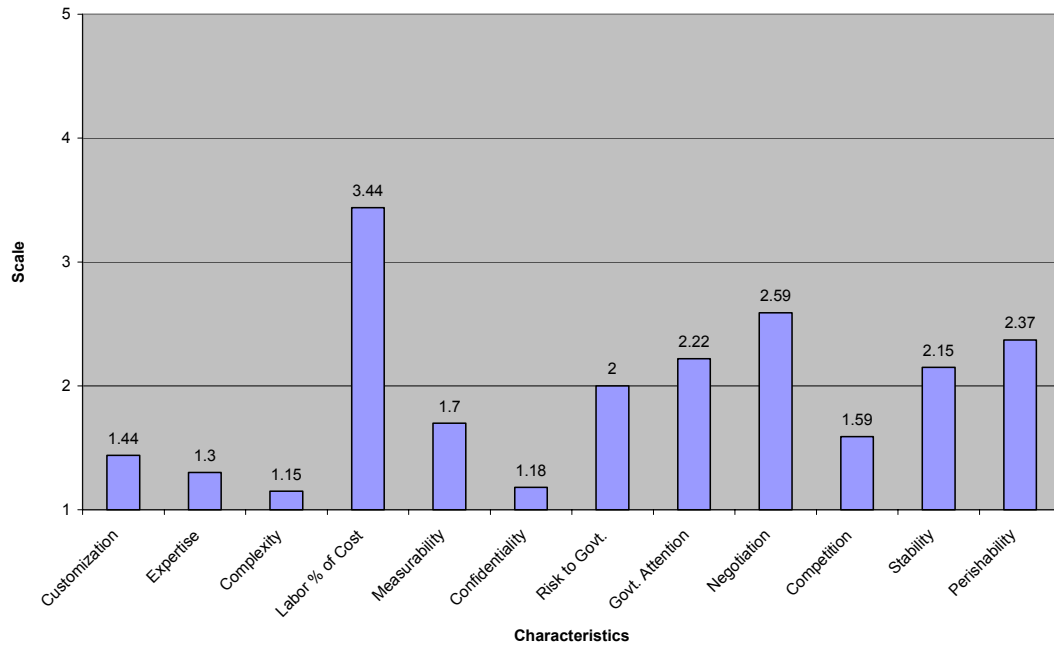
### Plumbing, Air Conditioning & Heating



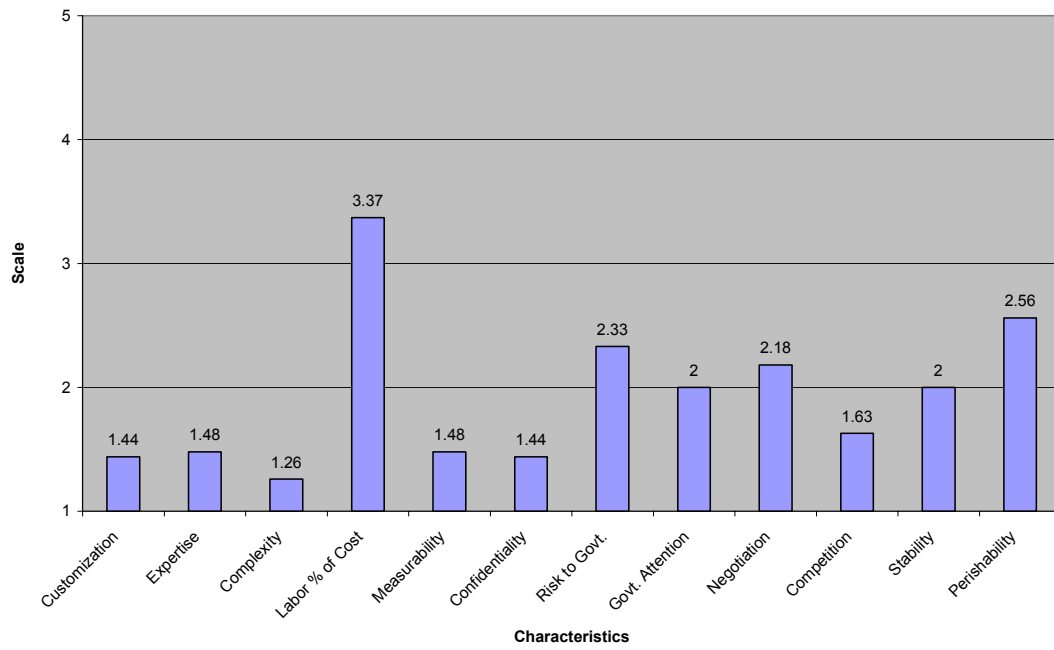
### Fire Prevention/Protection



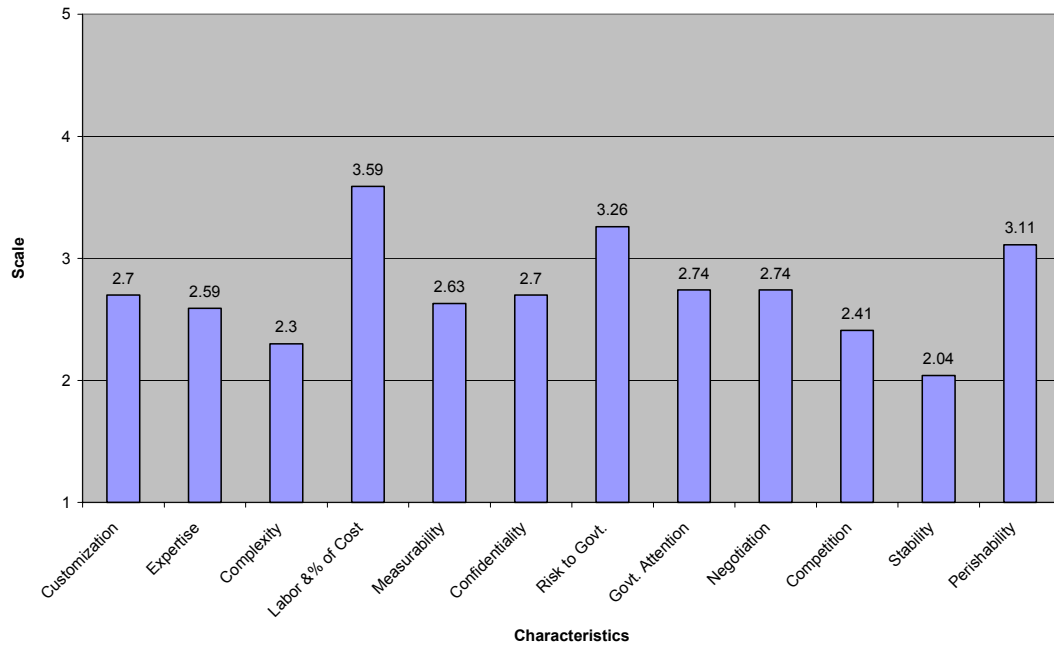
### Custodial & Janitorial



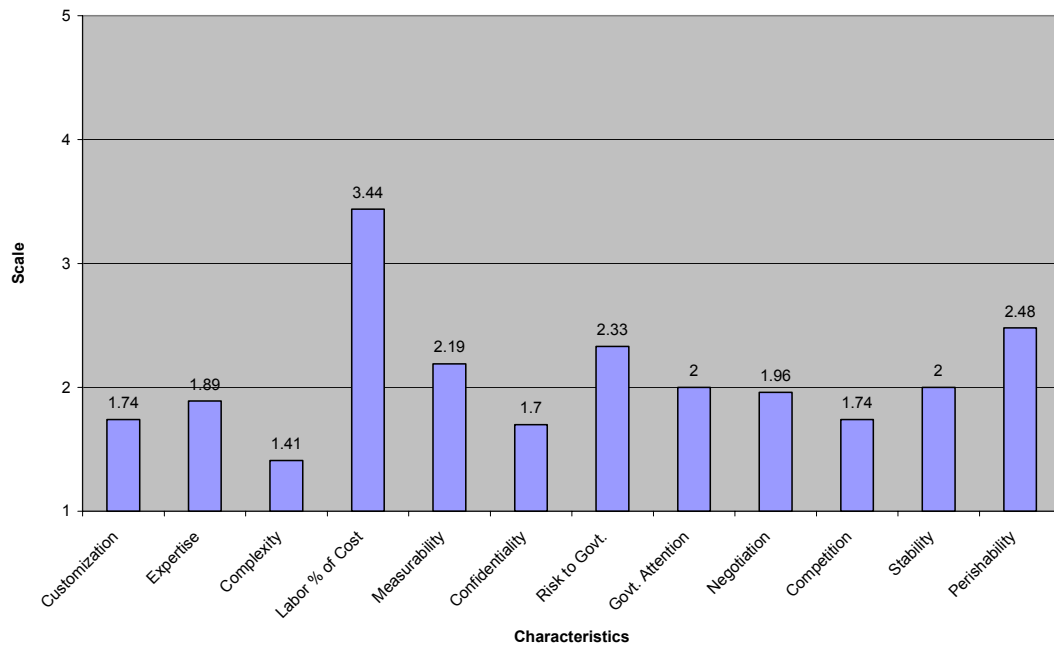
### Refuse Collection & Processing



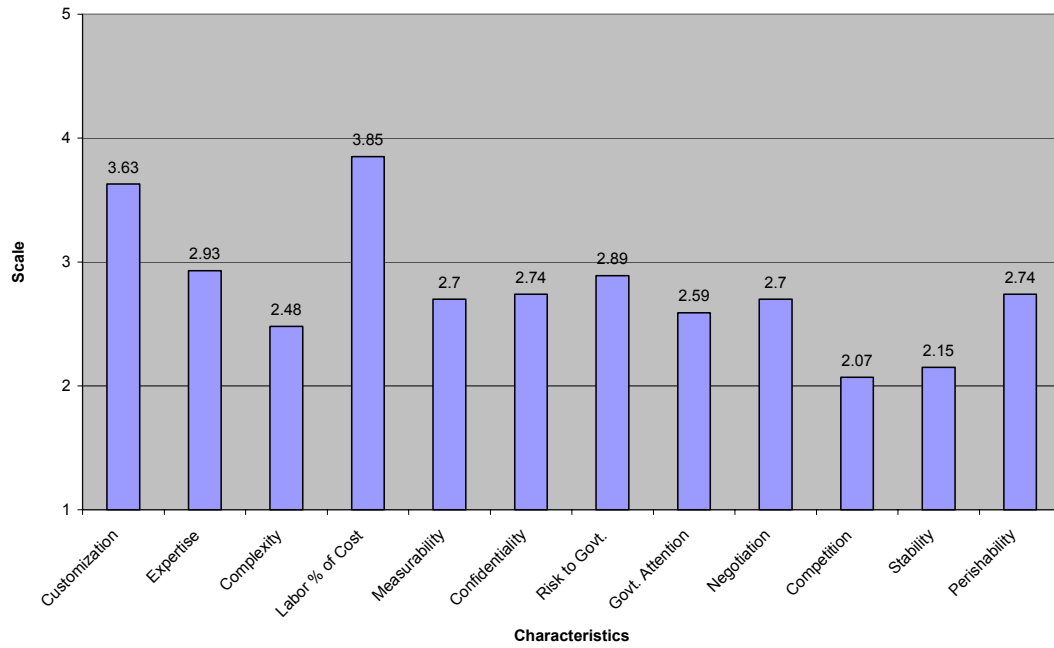
### Financial and Payroll



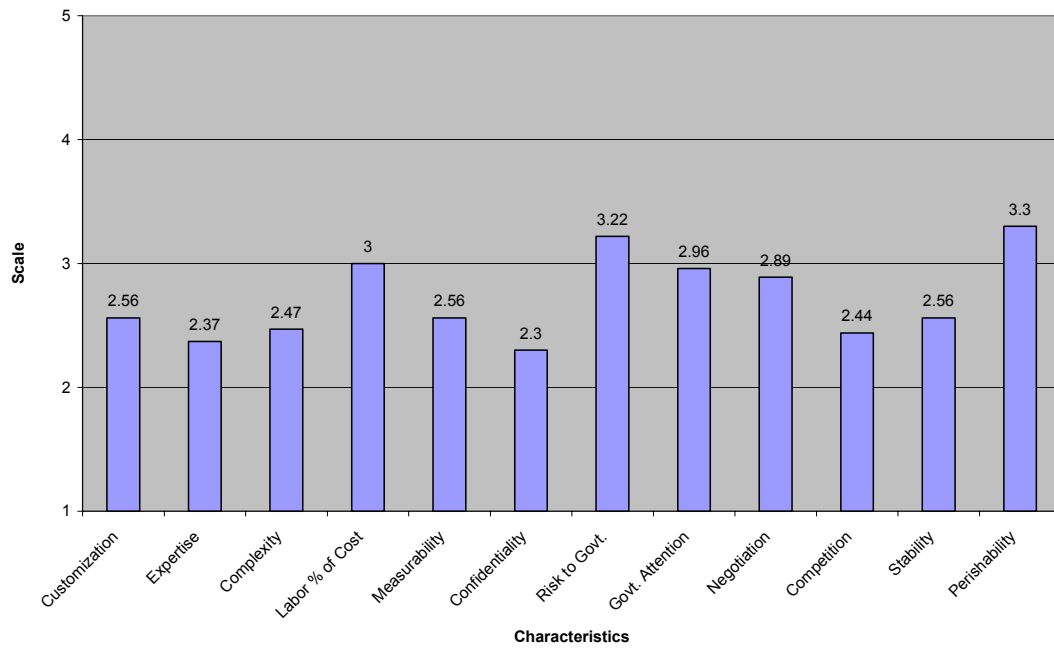
### Word Processing & Data Entry



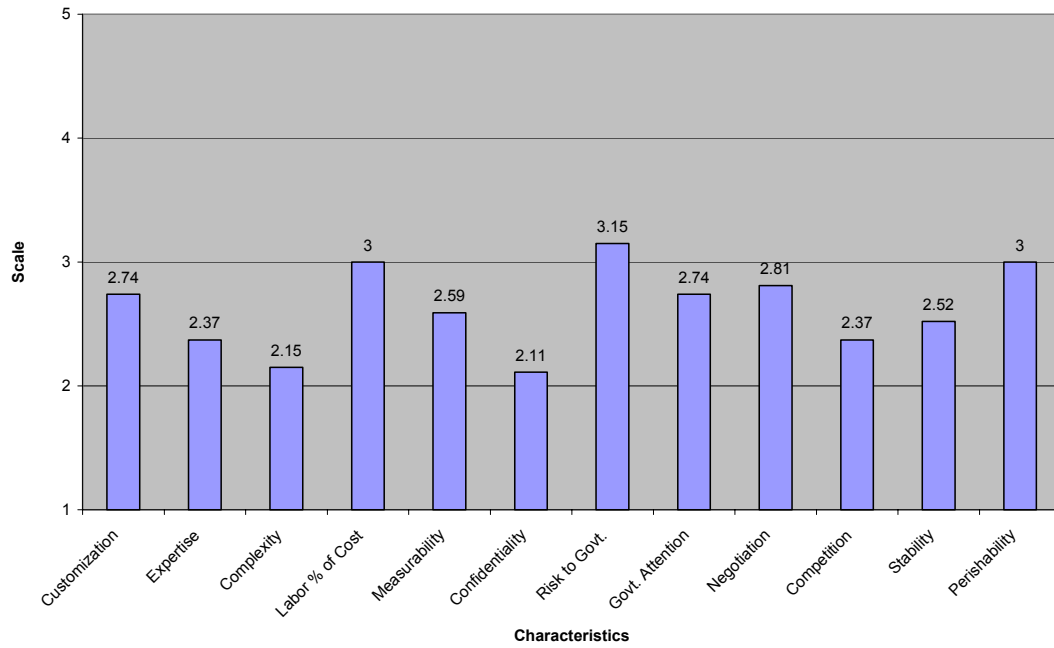
### Financial Auditing



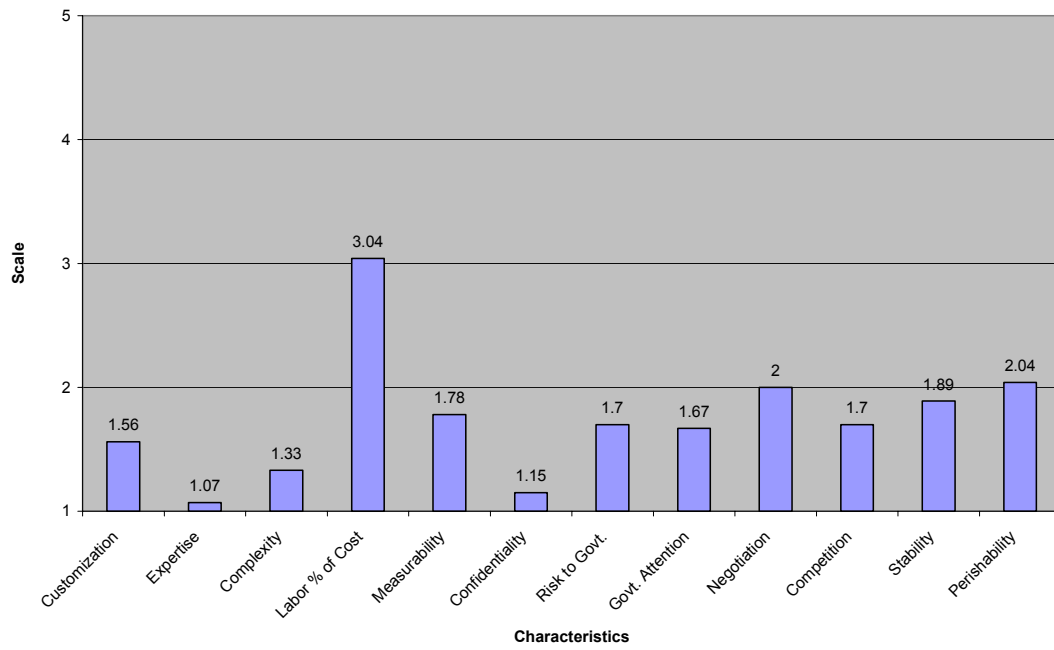
### Material Management



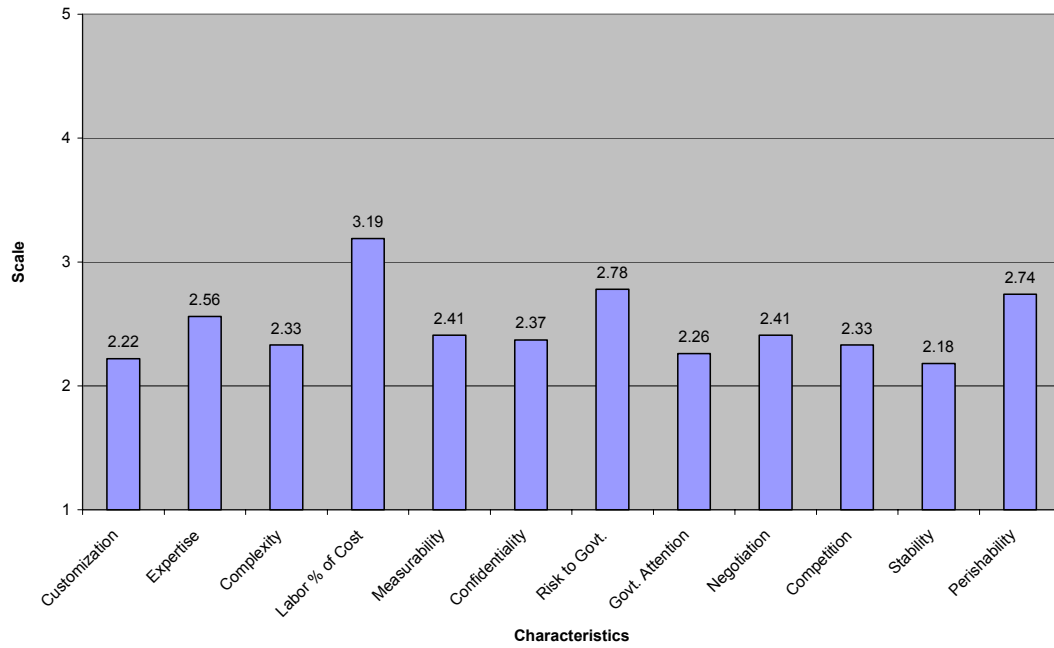
### Supply



### Laundry and Dry-Cleaning

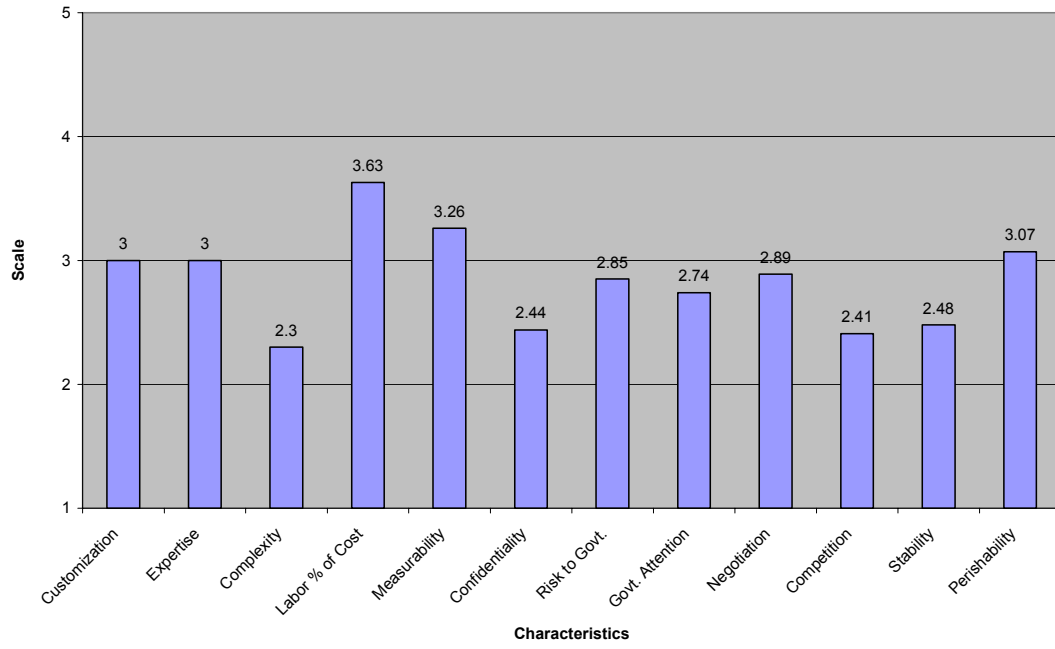


### Mapping and Charting

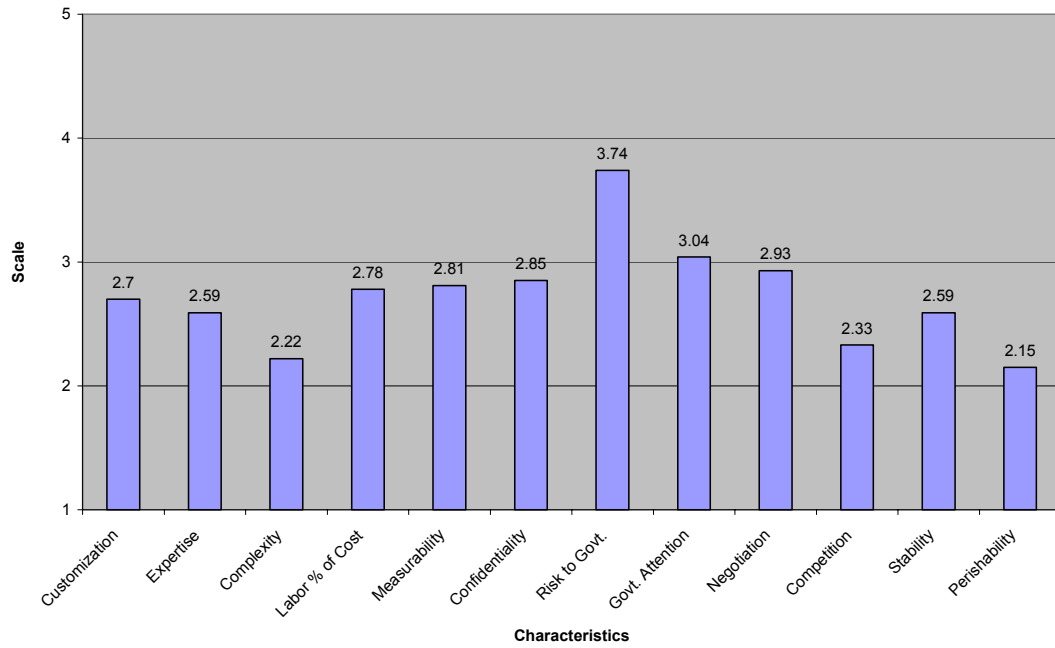




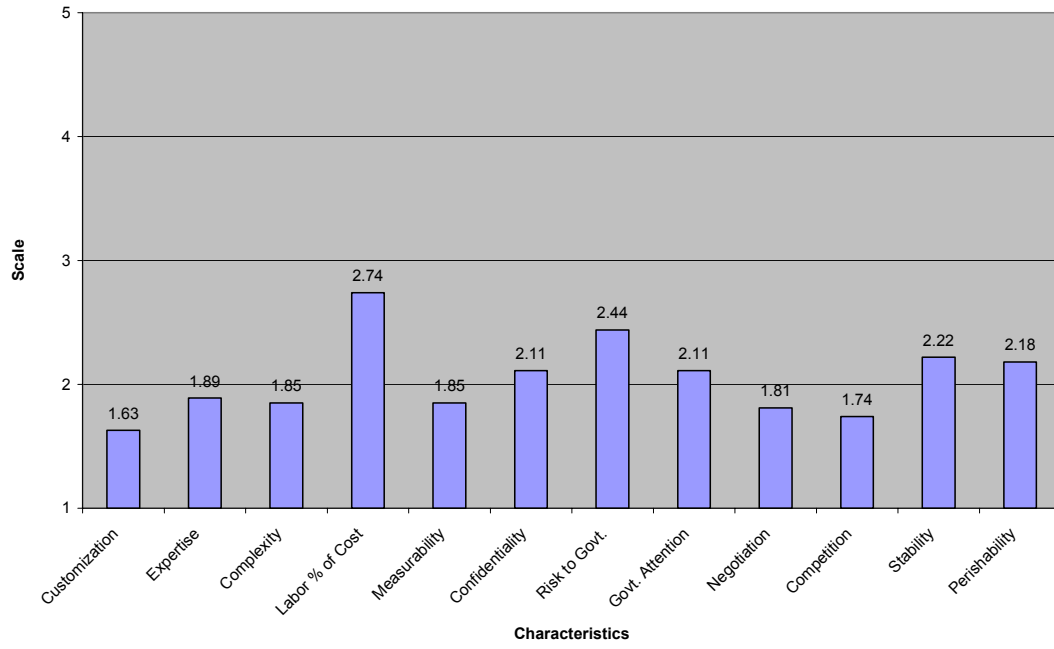
### Training



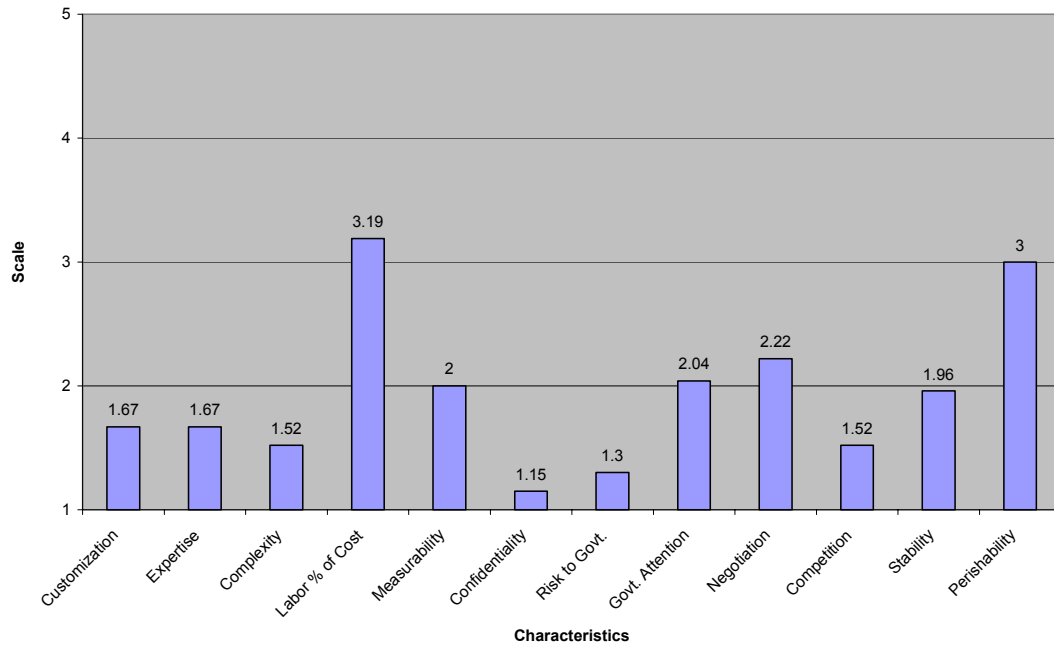
### Base Communications

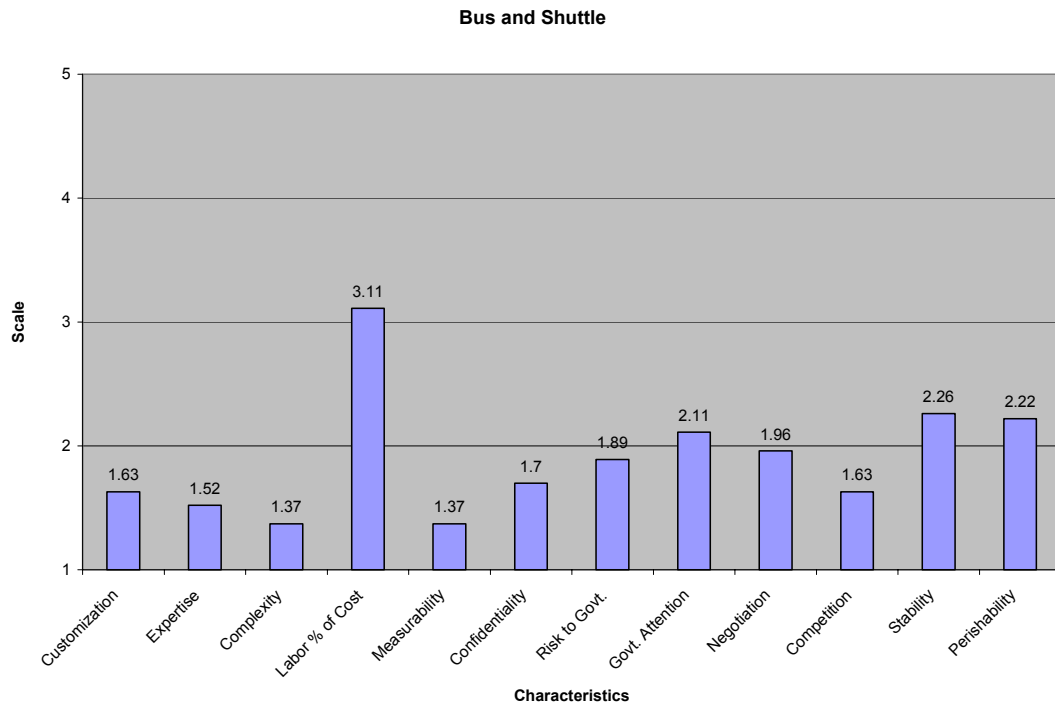
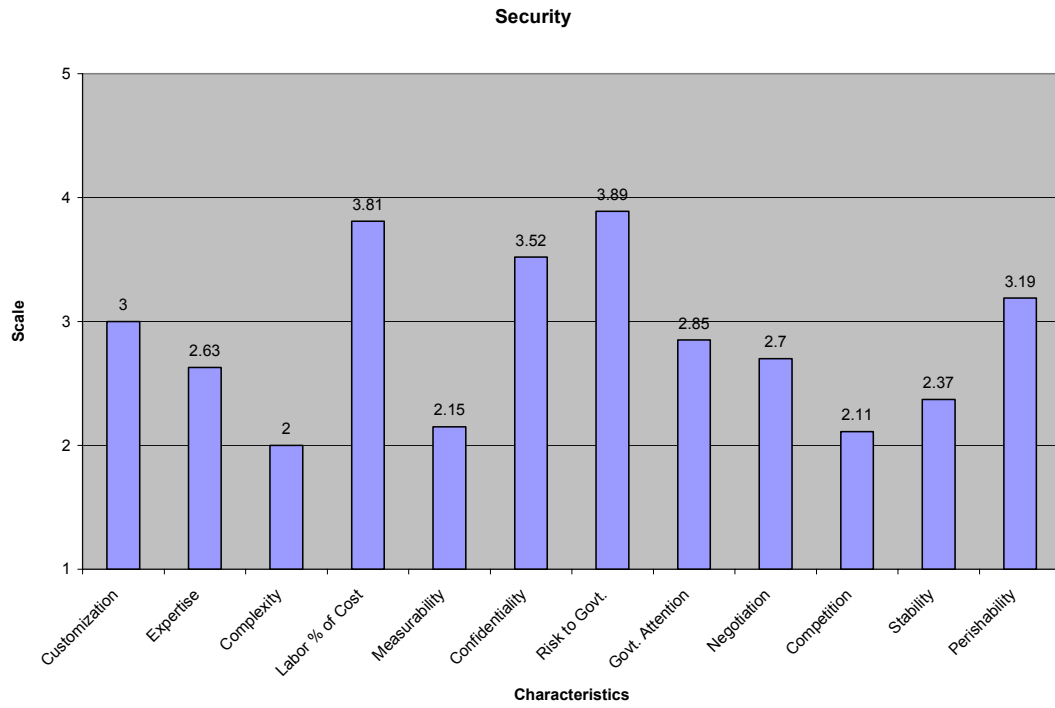


### Printing, Copying & Duplication

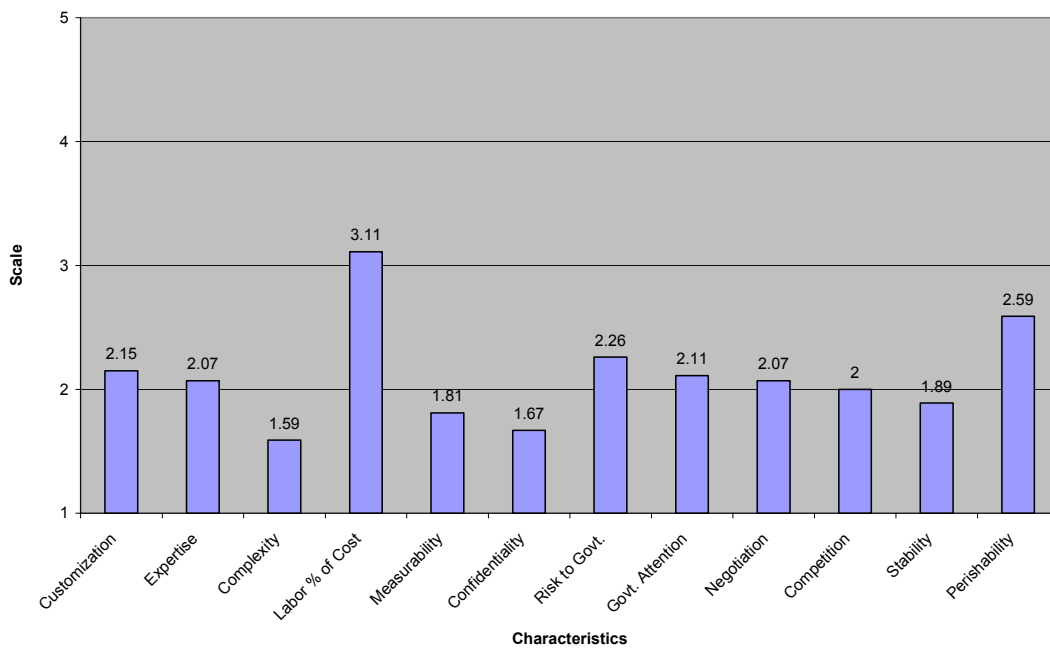


### Landscaping

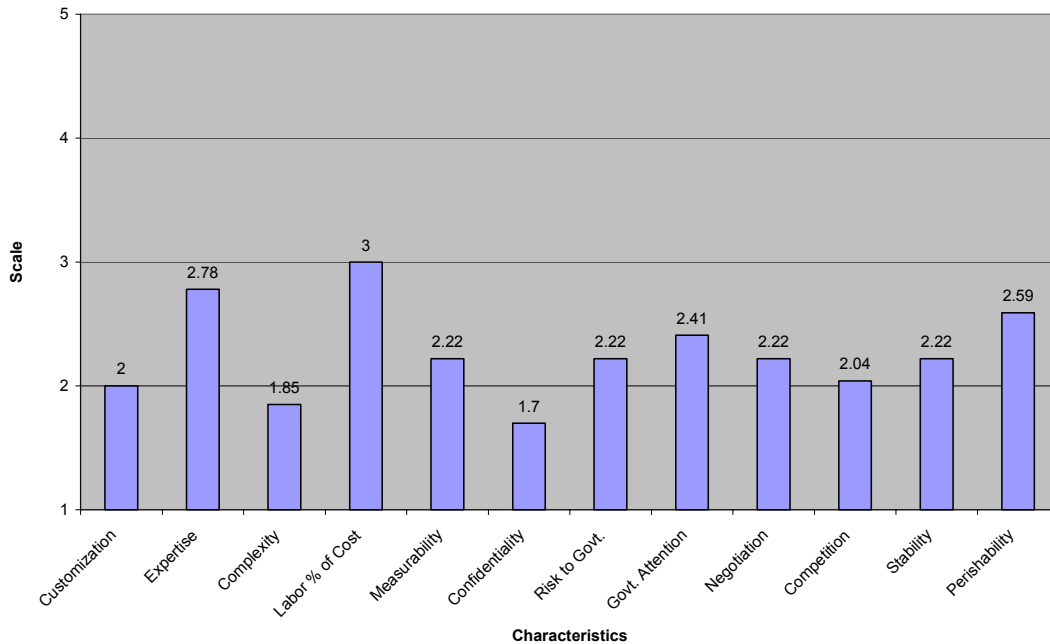




### Motor Pool Operations



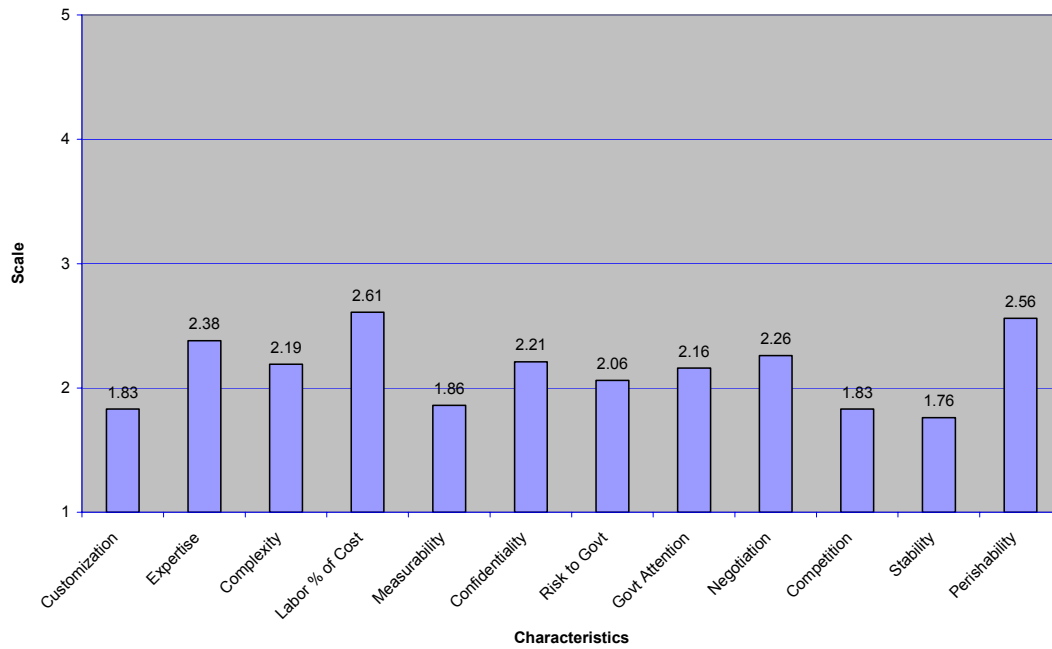
### Vehicle operations & Maintenance



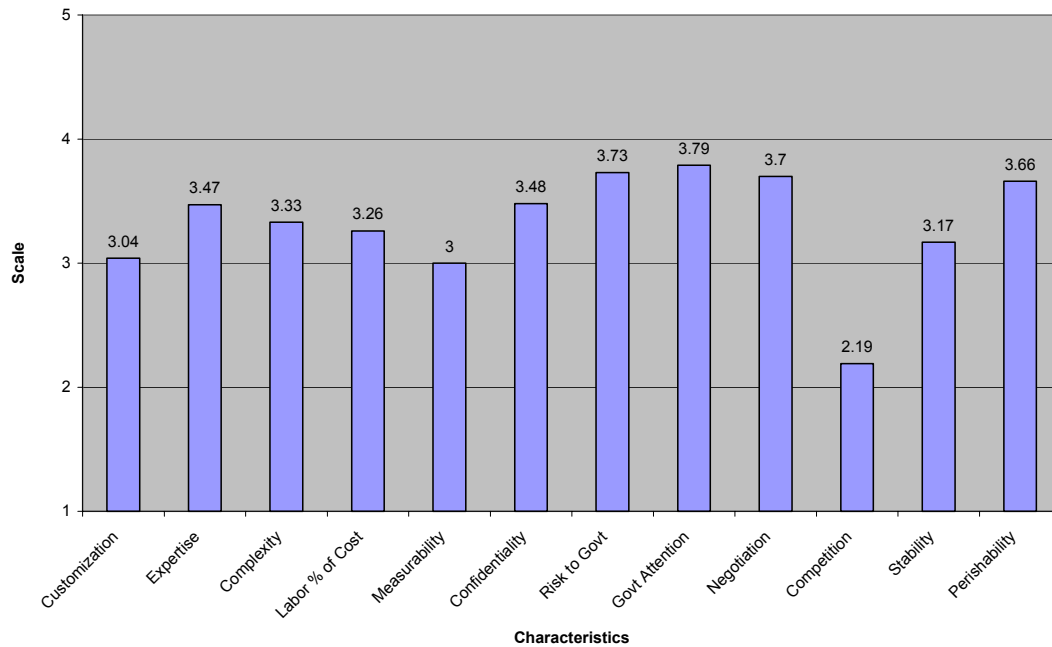
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## APPENDIX F. BAR GRAPHS FOR SERVICE GROUPS

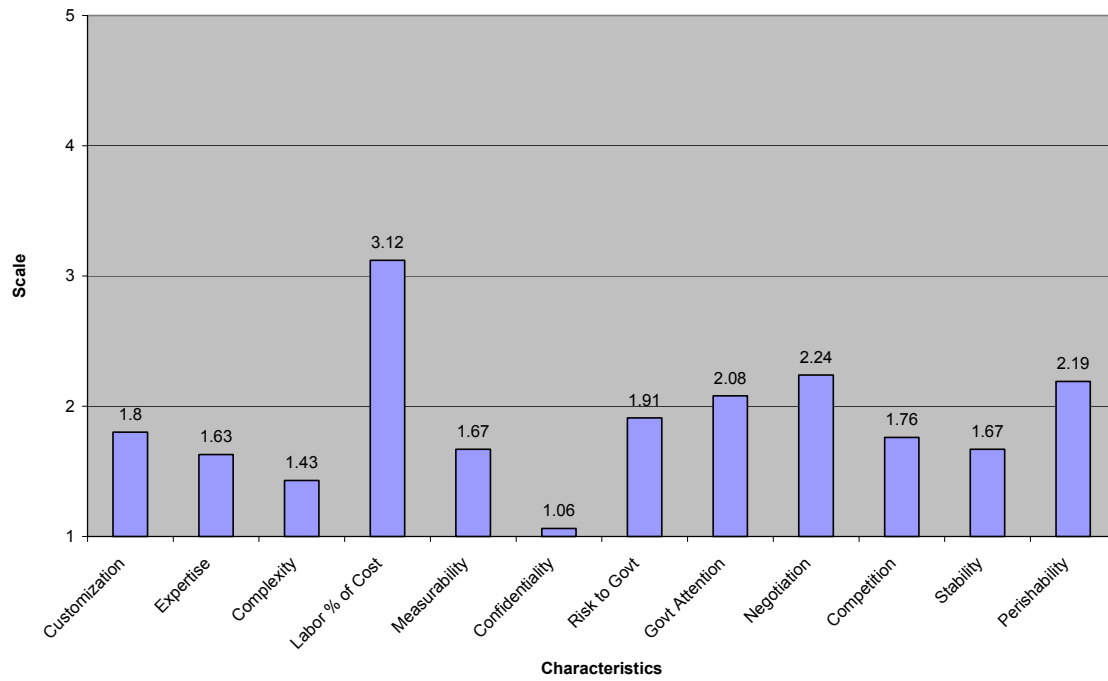
Group 1 - Audiovisual Products & Services (3 services)



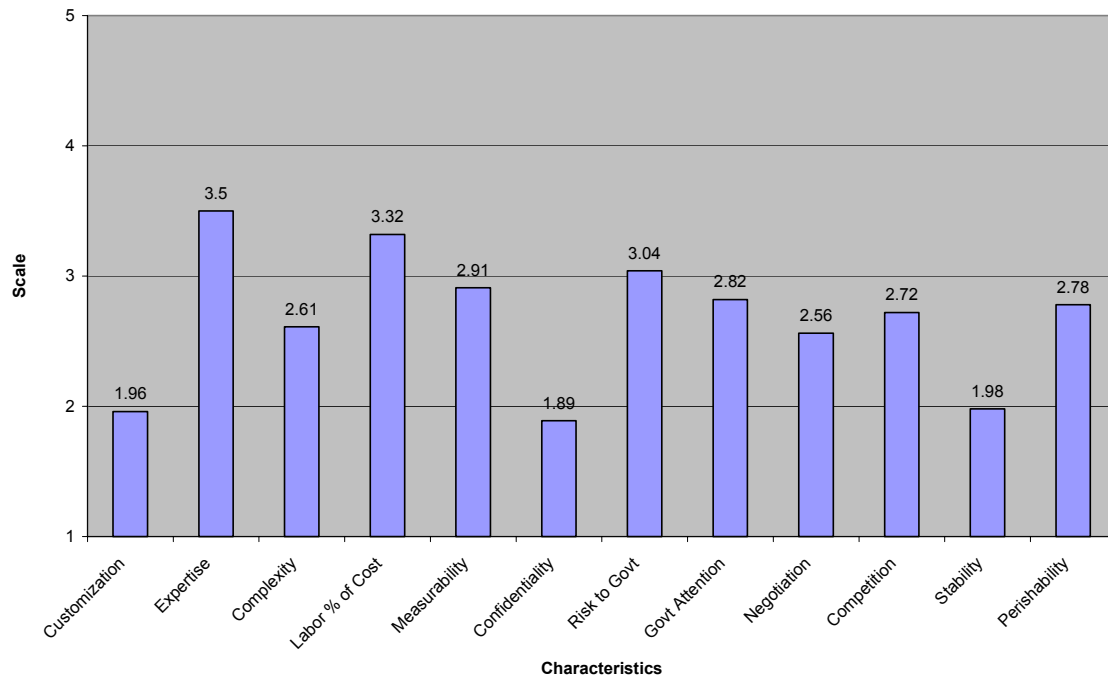
Group 2 - Information Technology Services (3 Services)



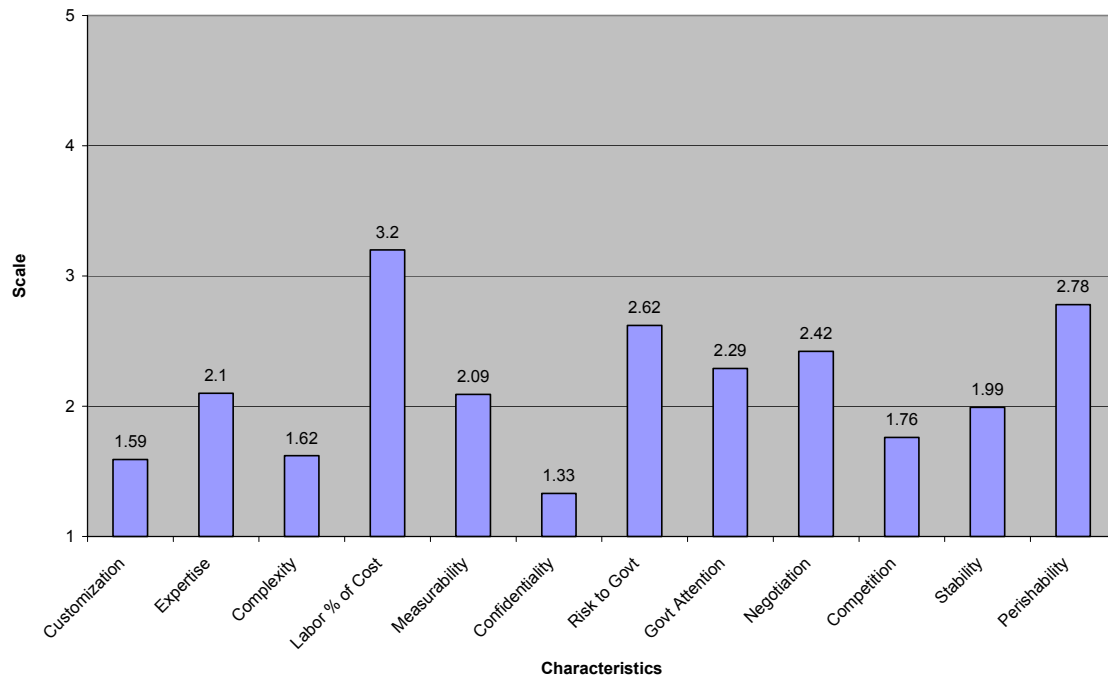
**Group 3 - Food Services (2 Services)**



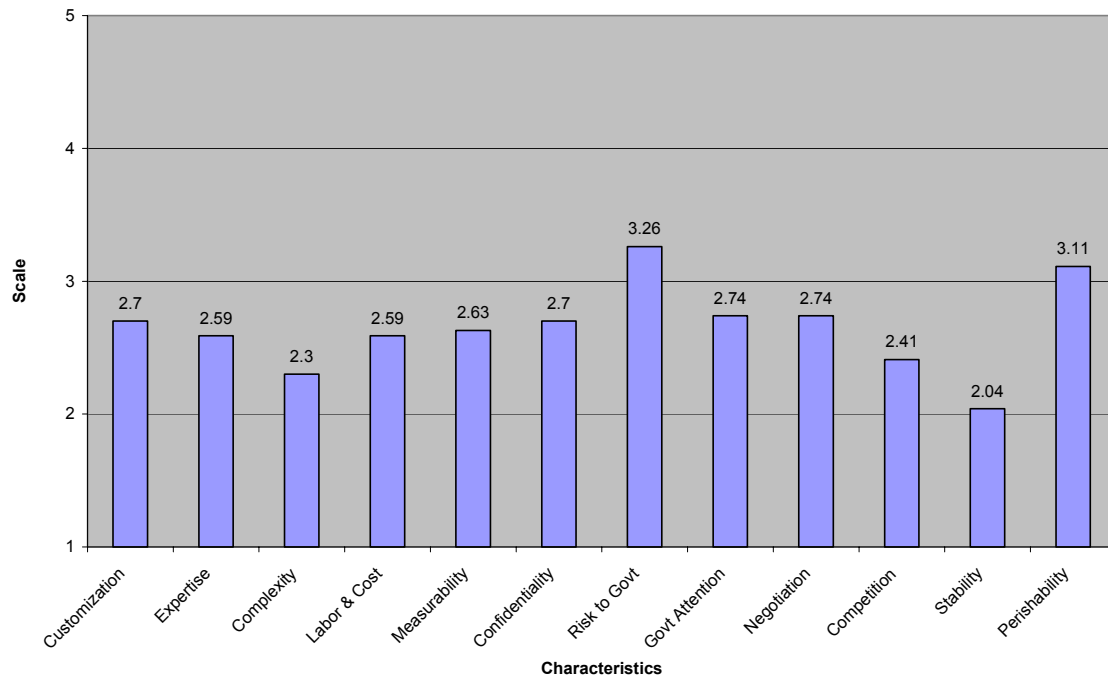
**Group 4 - Health Services (2 services)**



**Group 5 - Industrial Shops & Services (5 services)**

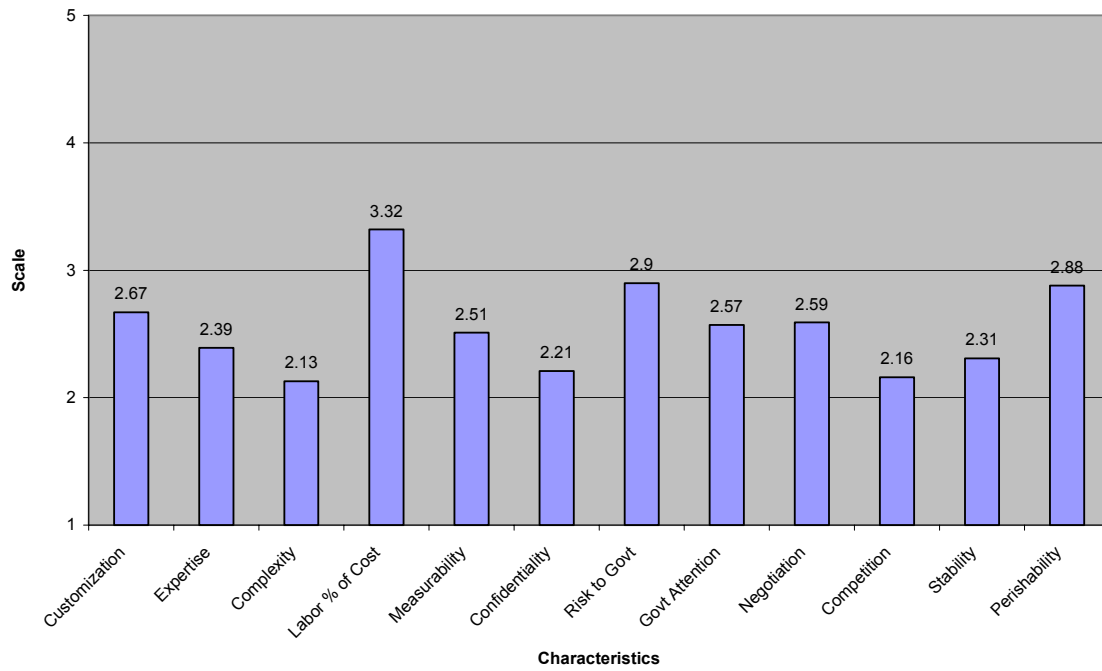


**Group 6 - Management Support Services (1 service)**

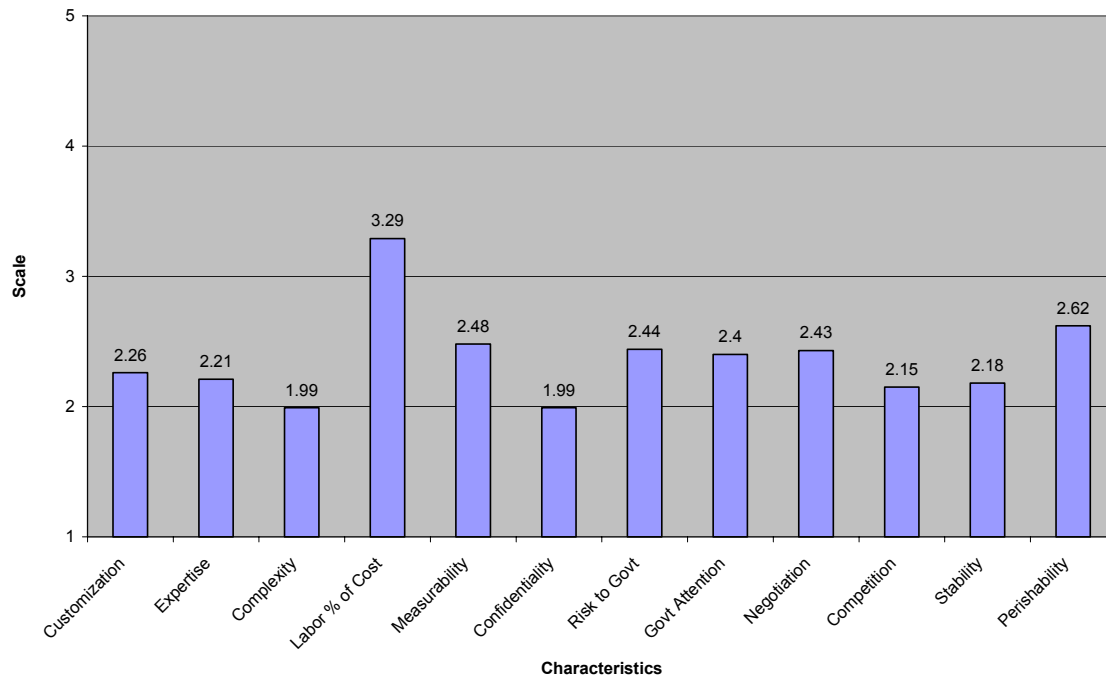




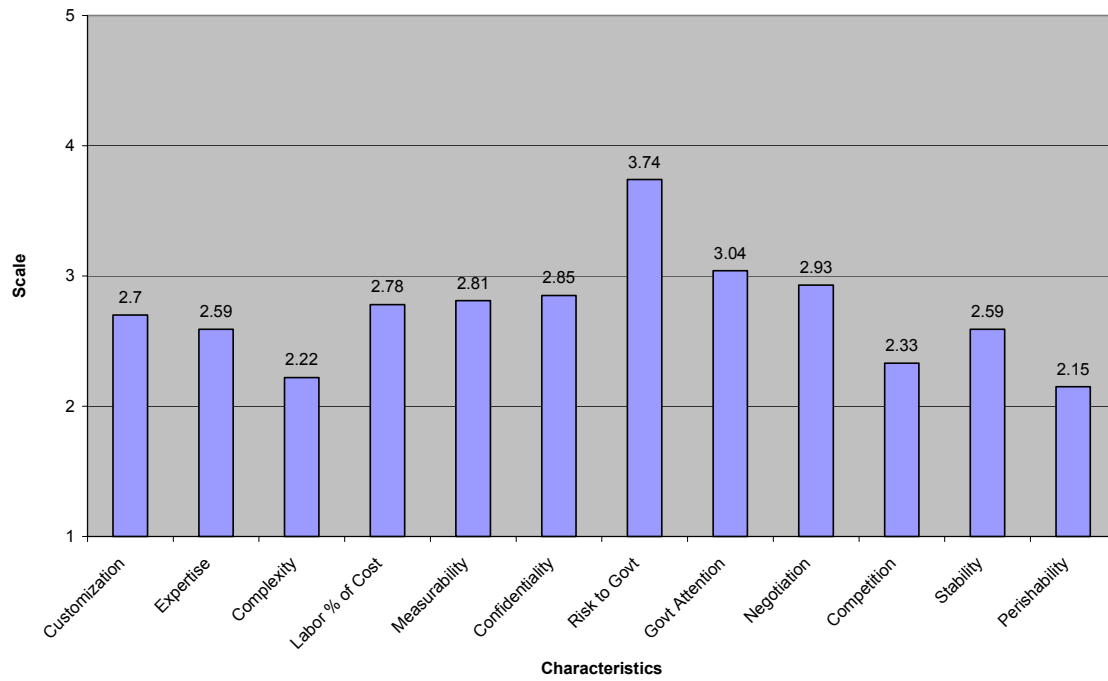
**Group 7 - Office and Administrative Services (4 services)**



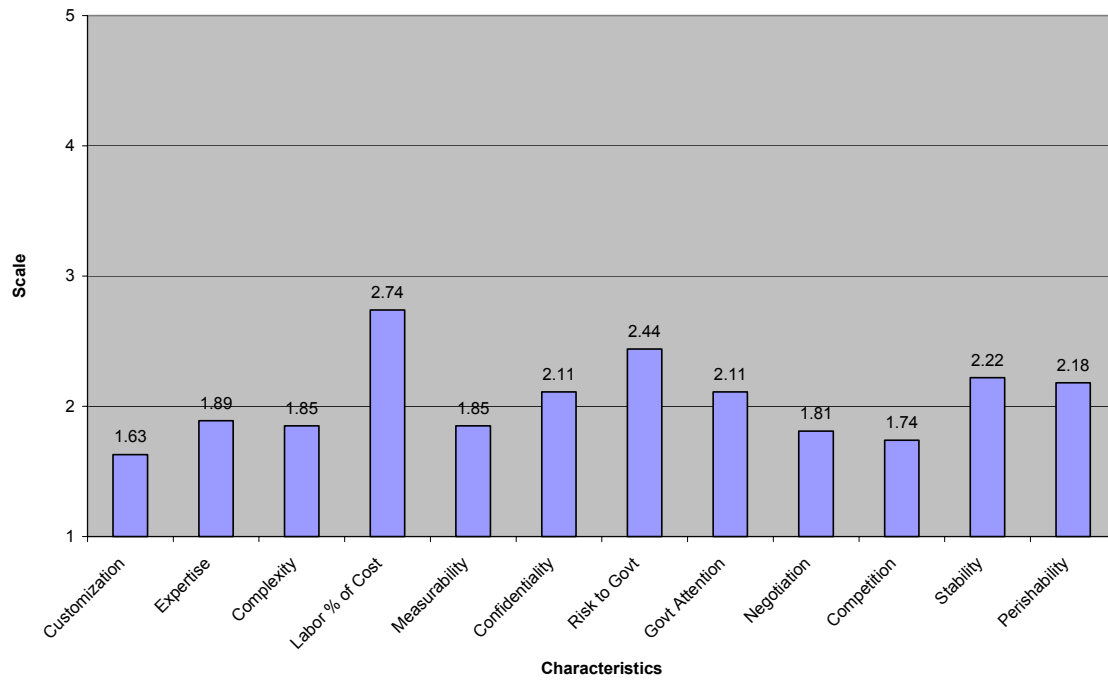
**Group 8 - Other Services (3 services)**



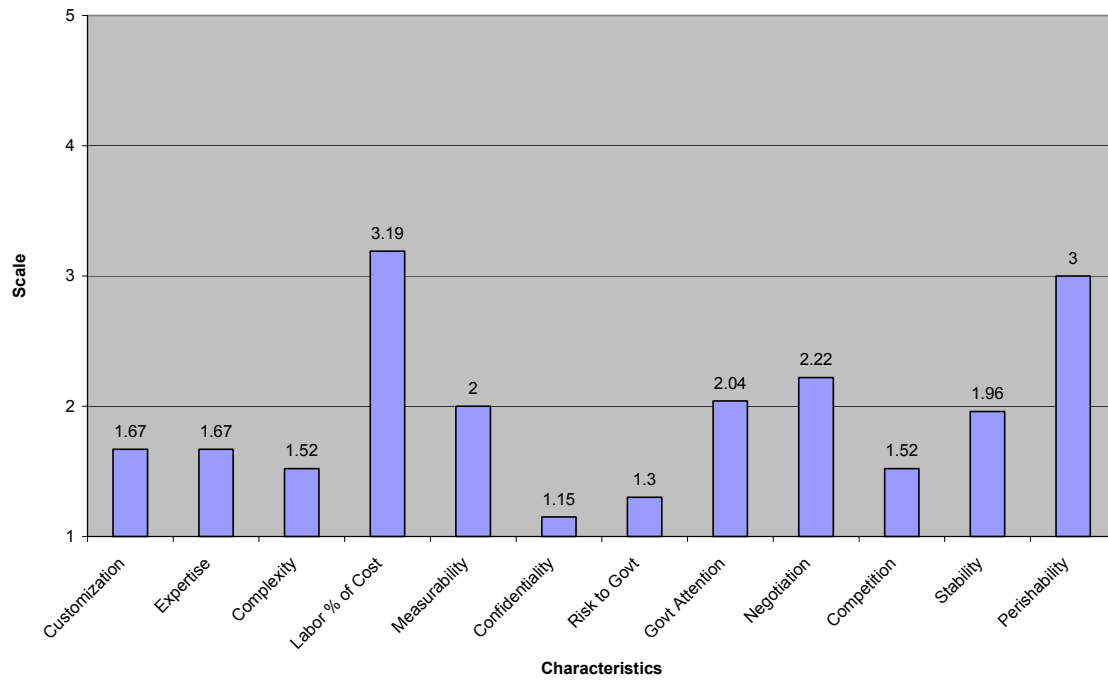
### Group 9 - Communications Systems (1 service)



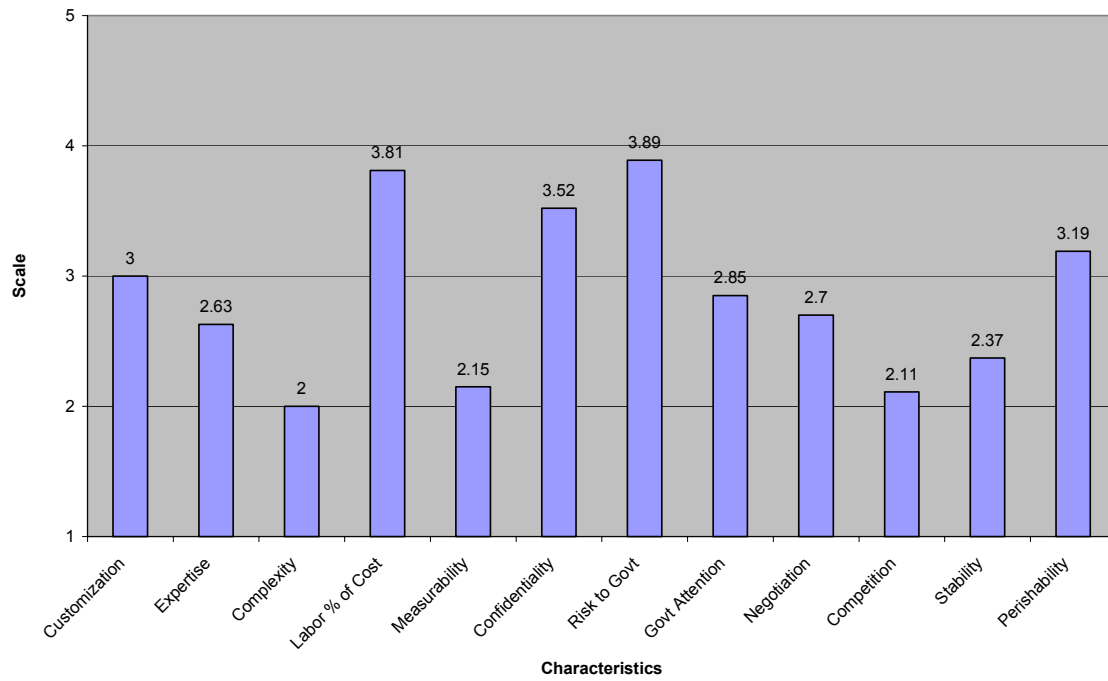
### Group 10 - Printing & Reproduction Services (1 service)

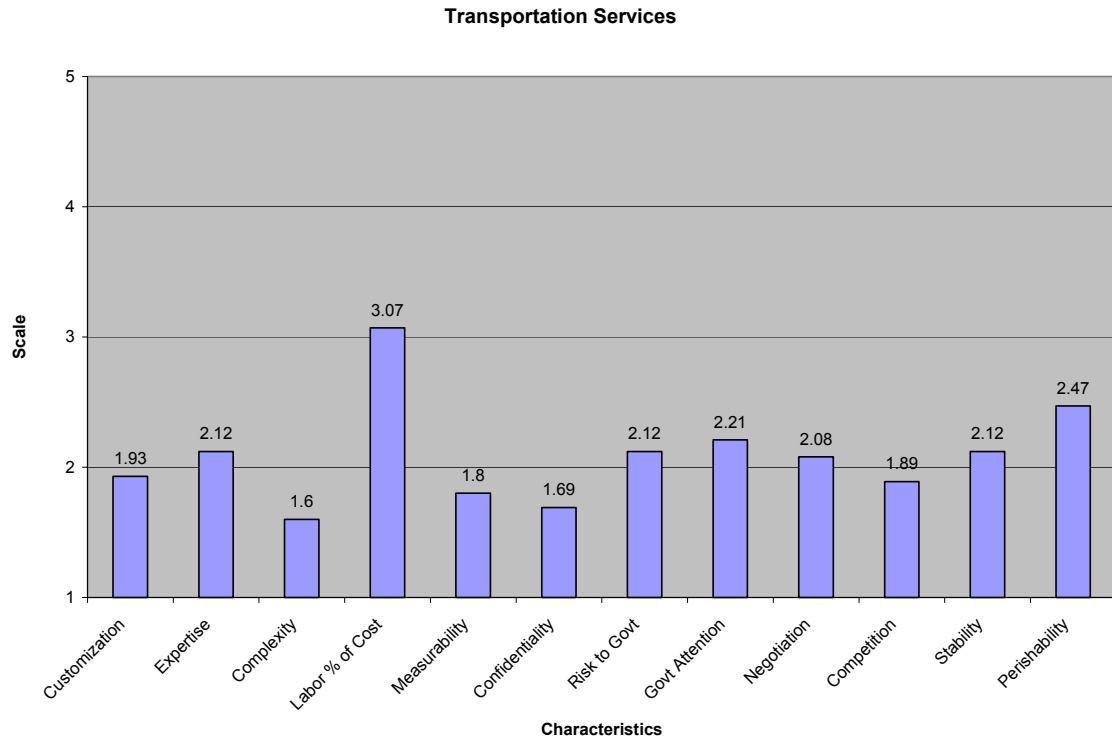


**Group 11 - Real Property (1 service)**



**Group 12 - Security Services (1 service)**





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